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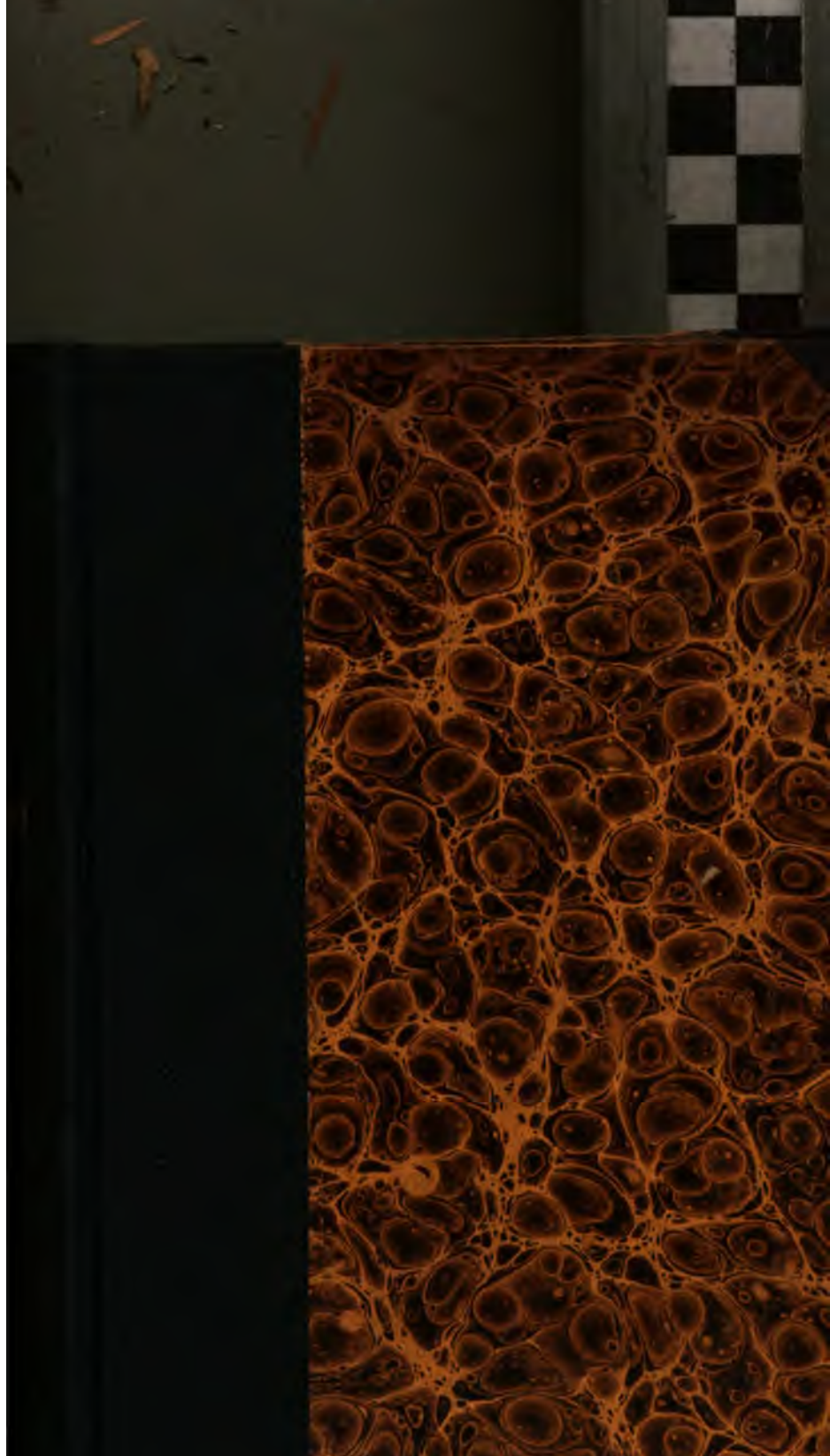
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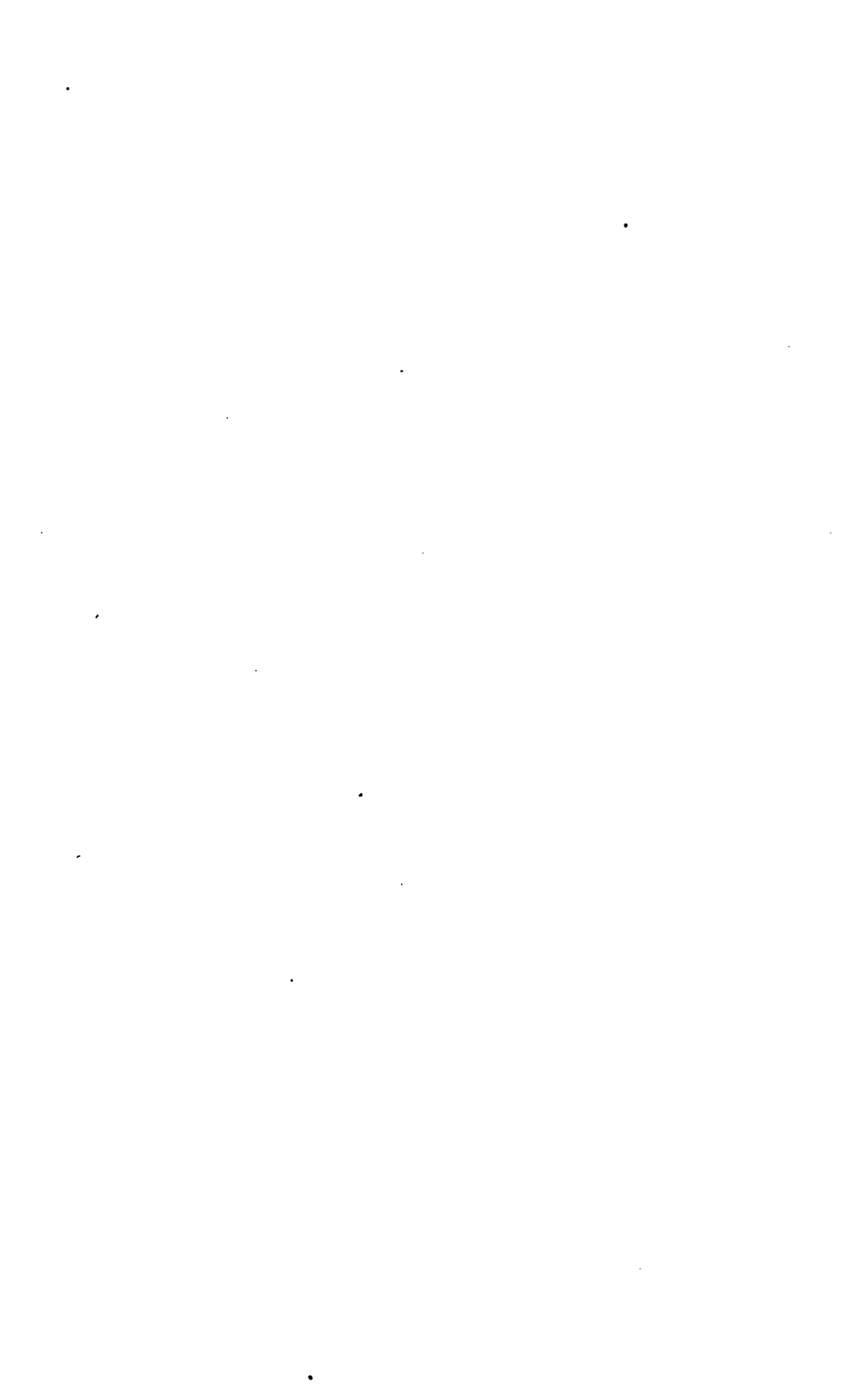
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ANNALS
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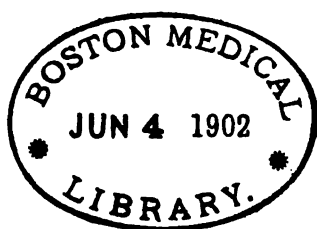
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NOTES ON THE BACTERIOLOGY OF THE CON- JUNCTIVAL SAC AND ITS BEARING UPON SURGICAL PROCEDURE.

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The writer might better have designated this title as "preliminary notes" in that, while some of the work undertaken by him and bearing on this subject is finished, yet other portions which would enlarge the scope of this paper and delve more accurately into minor points, still remain incomplete and require some months of laboratory and clinical investigation.

It was through the kindness and assistance of Dr. Wilson, Director of the Hoagland Laboratory, and his accomplished assistant director, Mr. Randolph, that I was enabled to carry out such bacteriological work as supplements the principal points of this paper, and I desire to express my thanks to them for their kindly, pains-taking interest and the help they willingly extended in this work when themselves engaged in the arduous duties of everyday laboratory work.

The subject of the bacteriology of the conjunctival sac perhaps has not received such attention in the past as it merits. Our older text books contain relatively nothing as to the aetiological bearing of bacteriology in conjunctival diseases, and modern ones dwell very meagrely upon this subject.

Glancing at the conjunctival sac, we cannot but be impressed with the fact that as far as external conditions are concerned, there seemingly could be no better "anatomical sink" for the collection and propagation of bacteriological life

than that existing within its folds. We have seemingly in this membrane and its anatomical distribution everything which at first thought would be favorable to constant suppurative conditions; a cul de sac provided with secretion containing organic substances, albumen, mucin, epithelium and salts, in minute quantity. Temperature suitable for the incubation of germ life. An aperture constantly in contact with an atmosphere filled with contaminating and infective material. Brought often in contact with the hand, no greater source of infection. Connected with a duct, "the nasal" through which infection can take place through a not infrequently infected organ, the nose and its appendages. That it is frequently infected, but enjoys singular immunity from the results of such infection is a bacteriological and clinical fact.

As might be expected of a wet surface exposed constantly to the atmosphere, it collects most of the organisms to be found in the air. If one desires to satisfy himself primarily as to the amount of infectious material or atmospheric contamination to which the eye is subject, a vivid picture may be obtained by a comparison with other wet surfaces under like conditions. Perhaps the best illustration may be obtained by glancing at that of common laboratory experience, viz.: the contamination of culture media. Expose a Petri dish containing nutritive material to the atmosphere for a few minutes, replace the cover and, under favorable conditions of temperature, many colonies are visible after a suitable period of incubation.

The eye must be the recipient of these same organisms and in addition to them, many that are conveyed from the surrounding parts, and also the other sources of infection already mentioned.

It is interesting, after glancing at these facts, to refer briefly to the bacteriological contents of the sac itself. Opinions differ as to the sterility of the normal conjunctiva.

Lawson Arnold, in a recent paper on the subject, states as the result of experiment in 200 cases, 20.5 per cent remained sterile. Morax and Randolph believe that the normal conjunctiva is never sterile. Franke found 28 per cent of his cases sterile.

The method in common use for obtaining cultures from the conjunctival secretion has been by means of the platinum loop, the advantages being that it is easily and quickly obtained and sterilization of the platinum loop is readily accomplished by passing through flame. It must be borne in mind, however, that under this method only a small portion of the secretion is obtainable, and if some process were devised by which a larger and more representative portion of the sac's

contents were transferred, it is doubtful if any conjunctivae would be found to be absolutely sterile.

My own observations were taken from the secretion of 50 conjunctivae presenting in each case the average normal degree to be found in large cities where the dust, debris and infective material in the atmosphere must of necessity produce a slight degree of hyperaemia.

Time will not admit nor is it the function of this paper to go into an extended description of the organisms found in these observations, and their methods of isolation, and I will only touch upon the more interesting points and those more especially which bear upon the latter part of the title of this paper.

The platinum loop method was utilized. Cultures were made directly from the eye into gelatine and agar, and were at once plated out, or by direct surface contact upon tubes of Loefflers' medium. Out of the fifty cases, thirteen were found to be sterile. The plates containing infected cultures contained a varying number of colonies ranging from one or two minute particles to ten, twenty, thirty colonies.

The bacteria found in the sac and isolated were as follows:

Staphylococcus pyogenes aureus.

Staphylococcus pyogenes albus,

Staphylococcus epidermis albus,

Aerobacillus citreus,

Xerosis bacillus,

Bacillus coli communis,

Bacillus subtilis,

Two of the yeast variety of *saccharomyces* and some others were found, but as they presented no pyogenic properties, they have not to this time been identified.

The point which interests us most is the presence in the normal conjunctival sac of the pus producing organisms. In these cases the *st. pyogenes aureus* was found twice. I must add, however, with reference to this organism, that time did not permit us to submit it to test of inoculation, but in every other respect they correspond with the *pyogenes aureus*.

The *st. pyogenes albus* and its kindred organization, the *epidermis albus* of Welsh were found in sixteen out of the fifty cases, the *pyogenes albus* constituting seven of that number.

The difference between these organisms is that the former is more virulent than the latter, which liquifies gelatine more slowly.

That the pyogenic bacteria are found in the conjunctival secretion is an established fact, and that has been the experience of most observers.

In contrast, however, to this fact, seemingly prejudicial to suppuration, we have the following contradictions:

I. The comparative rarity of suppurative conjunctival conditions taking the population as a whole.

II. The relative infrequency of suppuration after operative interference even under adverse circumstances.

III. The large proportion of sterile conjunctivae found in in the bacteriological investigations of most observers.

There must be some rational explanation of this immunity of the normal conjunctiva, its reception of infective material on the one hand, which we know occurs, and its clinical insignificance and innocuous result on the other, which is in as much evidence.

The writer believes the the structural and functional properties by means of which the eye takes care of infective material, may be discussed under four headings:

I. The property, its normal epithelial surface possesses of resisting the inroads of infection;

II. The special property of the phagocyte possesses in antagonizing pyogenic or other bacterial life;

III. The properties of the lachrymal and conjunctival secretion itself when normal of inhibiting growth of germ life;

IV. The irrigative apparatus by means of which the eye is constantly douched by a steady flow from the lachrymal gland to the nasal duct.

I. The property the normal epithelial surface possesses, of resisting the inroads of infection. The epithelial surface undoubtedly plays an important part in the antagonism and growth of these bacteria.

It is, of course, clinically noticeable that if one finds a normal lid lining there is, as a rule, normal secretion. On the other hand, an inflamed condition means not only diminished resistance on the part of the structure itself, and the consequent inroad of bacterial life into its interstices, but also what is, perhaps, more instrumental in furthering bacterial growth, the outpouring of blood element through attenuated vessels into the conjunctival sac, thus adding to the lachrymal secretion material better suited for rapid bacterial propagation.

We can safely assume, then, what is, in reality, a clinical fact, that the epithelial lining of the sac when normal is capable of resisting the inroads of most infections, but should it, from mechanical irritation, caused by dust, or injury, etc., become the subject of inflammation, the conditions both of the membrane itself and the secretion are altered, and together form a suitable nidus for propagation of germ life.

This matter of diminished resistance we see illustrated in other portions of the body. To quote from Abbott: "Hal-

sted has frequently introduced the *st. pyogenes aureus* in bouillon culture or watery suspension into the peritoneum without the slightest injury to the animal, if, however, some substance which acts as a direct irritant to the intestines, such as a small piece of potato, upon which the organisms are growing, be at the same time introduced, or the intestines mechanically injured, so that there is a disturbance of circulation, the introduction of these organisms is followed by acute and fatal peritonitis."

This only demonstrates the resistive properties of these sensitive membranes under normal conditions, and the important part they play in maintaining equilibrium.

II. The special property the phagocyte possesses in antagonizing pyogenic or other bacterial life. We know by clinical experience and bacteriological research, the greater the outpouring of exudative material from an inflamed lid the more likelihood there is of a suitable nidus for germ life, but fortunately as the transudation from permeable vessels takes place; with it, the phagocyte exerts its influence upon bacterial life. We are all familiar with the fact discovered by Leber and others, that leucocytes, by virtue of chemotaxis, are attracted at a distance by microbes and other particles, move toward these bodies, and, coming in contact with them, englobe them by means of their tactile sensibility.

Just how much this acts in the conjunctival sac as an antagonist to microbic growth is a question, but it undoubtedly acts in this capacity as much as it does in other portions of the body, as, for instance, the peritoneum.

III. The property of the lachrymal and conjunctival secretions when normal of inhibiting germ life.

It has been regarded possible by some clinicians, and also by others making bacteriological investigation, that by reason of this relative sterility of the sac in a large proportion of cases, the secretion might possess some antiseptic property in itself for inhibiting germ life. The writer, after having made this a matter of investigation, feels that it is erroneous.

With some difficulty, thirty minims of human tear secretion was obtained. These were placed without sterilization in a Petri dish, the groove of the circumference of cover fitting into the circumference of the dish, this being smeared with vaseline to prevent evaporation. A control culture consisting of a platinum loop of recognized size was taken from the tear solution and transferred to the surface of an agar tube. This, in turn, was plated and incubated. Twenty-four hours in the incubator resulted in 1378 colonies. The tear solution was then inoculated with a mixed culture containing different organisms. A culture being then taken from this

in the original manner, plated and incubated, resulted in an increase, there being 2,200 colonies after twenty-four hours. A third culture taken in the same way resulted in 62,000 colonies after twenty-four hours of incubation. It must be added however, that after the second culture, up to which time there had been an undoubted increase of the organisms introduced into tear solution, there was a diminution as far as they, the inoculated organisms, were concerned, after the third; showing, that while they grew primarily, the medium was not a sustaining one for them. The organism which flourished and which caused the rapid increase in the number of colonies after the third culture was taken, was a small round opaque colony which was seen in the original control culture before the inoculation of mixed organisms with the normal tear solution.

The deduction to be made from these experiments is that while the tear secretion is not the best possible medium for germ life, it is capable of sustaining certain forms of bacterial life for a limited period, and others seemingly flourish continually in it.

IV. The irrigative apparatus by means of which the eye is constantly douched in a steady flow from lachrymal gland to nasal duct.

The lachrymal gland, situated above the outer angle of the lid under the orbit, provides for the most part, the secretion of the eye which is conveyed by four or five larger and eight or ten smaller excretory ducts to the fornix conjunctivae. This is supplemented by the secretion of the conjunctiva itself. The overflow onto the face is prevented to a certain degree by sebaceous deposit upon the margin of the lids. The constant flow toward the nasal duct is due to syphonic action, by diminution of the amount of air in the nasal cavities during inspiration and the compressive action of the orbicularis muscle forcing the tears toward the nose. We, therefore, have a constant, and to a certain extent, forcible flow of saline solution which must of necessity convey with it free impurities or bacterial life.

With a view of determining the period of time lapsing between the inception of infective element and its disappearance, the following experiment was resorted to:

A guinea pig with a normal conjunctiva having been secured, a control culture of the secretion of agar was obtained. The conjunctival sac was then inoculated by a platinum loop containing the bacillus prodigiosus, an organism selected by reason of its easy recognition, presenting a bright red hue in culture. Successive cultures were taken every half hour at first, and at longer intervals later. The shortest period

which this flow took to dissipate this organism was twenty-four hours, and in one case it was some two and a half days in disappearing. It is just possible, however, that the pig reinfects his eye by contact with portions of the cage where he had previously deposited, in this latter case.

The writer, basing his opinion on the foregoing experiments, is inclined to believe that this irrigative function of the eye is its most valuable one, both in the disposition of foreign material and the constant change of media which must be an important factor in retarding the growth of numerous organisms.

This brings us to the second portion of this paper—its bearing on operative procedure.

The immunity from suppurative conditions which the eye enjoys after operative procedure, even under adverse circumstances, is a matter of striking interest. It may be owing to this that we hear not infrequently comment as to the want of aseptic precaution in ophthalmic surgery.

Relying upon the above mentioned antagonistic factors to bacterial life, or more likely the clinical conditions which exemplify them, the ophthalmic surgeon may feel that strenuous efforts as to establishing an aseptic field for operation are unnecessary in an organ supplied itself with such perfect apparatus for sterilization.

The question naturally arises, are we justified in adopting less stringent procedures, in the attainment of asepsis in eye surgery? Clinical and bacteriological experience teach us that in abnormal inflammatory conditions of the conjunctiva, these organisms flourish, and while in all cases they may not be the exciting cause of inflammation, yet they are undoubtedly the most important factor after it is established.

This indicates that to the normal eye secretion has been added nutritive material better suited for the rapid propagation of these organisms.

Is not, therefore, the same principle applicable in operative interference because it must of necessity add to the tear secreting blood element? and although clinically it is a fact that in most cases the irrigative apparatus and other means the eye has of taking care of itself, is capable of antagonizing bacterial growth, yet there are those incidental cases of severe suppuration, few they may be, and occurring at infrequent intervals, but nevertheless most disastrous to an organ valuable as life itself.

We therefore learn that conditions are sometimes reversed when the organisms of infection assume the upper hand, and the irrigative apparatus is by no means infallible.

For this reason we have formed the opinion that notwithstanding the fact that we have valuable agents in the eye for

maintaining asepsis, effort to put the conjunctival sac in the best possible condition for them to perfectly complete their work, are strenuously necessary. These must of necessity be preventive of the introduction of germ life from without, and the elimination of residual bacteria from within the sac. The first can only be accomplished by adopting the same regimen which modern general surgeons follow in the preparation of the operative field, both with regard to person and instruments, and also the surrounding portions of the orbit. The latter, by use of such solution as will thoroughly wash out the cul de sac without diminishing resistance. Strong antiseptics must of necessity be barred, but the douching with some mild antiseptic innocuous solution should, in the writer's mind, be much more thorough than is generally practiced.

To briefly review the principal points we learn the following:

I. That the pyogenic or pus producing organisms are found in the normal conjunctival secretion, although probably in attenuated form.

II. That under normal conditions they do not propagate.

III. That the eye under normal conditions is bountifully supplied with means of antagonizing bacterial growth.

IV. That diminished resistance such as occur in inflammations of the membrane in operative interference, alter the nutritive nature of the secretion and probably convert it into a more suitable media for germ life.

V. That the secretion of the eye is not an antiseptic in itself.

VI. That strong antiseptics in the conjunctival sac diminish the resistance and place the eye on a lower plane to resist germ invasion.

VII. That much attention should be given to washing out the residual bacteria prior to operation.

VIII. That as much care should be taken in regard to antiseptics and cleanliness in the external preparation of both patient and operator, as is adopted by the general surgeon of modern times, as, while the danger of suppuration is more remote, the result if it occurs is more disastrous.

ALVEOLAR SARCOMA OF THE CHOROID.*

BY WILLIAM POSEY, M. D., AND EDWARD A.
SHUMWAY, M. D.

(From the Ophthalmological Clinic of the Howard Hospital and the Polyclinic Laboratories.)

M. C., aged seventy years, came to the Howard Hospital August 28, 1897, on account of intense pain in her right eye, which had been almost constant for three months previously. She dated the trouble in her eye to a blow which she had received over the right orbit several months before the pain manifested itself, although she seemed convinced that the vision, with the exception of the perception of rainbow rings of color and lights before the eye, had been good until the first appearance of the pain. The loss of sight, which then manifested itself, was gradual, though blindness finally supervened. Her health had always been good.

When first seen at the hospital it was noted that, in addition to a marked degree of tarsal and ciliary injection in the right eye, there was a localized boggy and edematous condition of the lower inner part of the bulbar conjunctiva. The cornea was steamy and needle-stuck was slightly insensitive, the anterior chamber was much reduced in size, the pupil was 3 mm., and did not respond to light stimulus. Tension was + 3. No red reflex could be obtained from the fundus on account of the condition of the cataractous lens. The left eye was quiet, the pupil was 2 mm. in size, and responded well to light and accommodation stimuli. The fundus was normal beyond a slight degree of hypermetropia. Vision in the right eye was reduced to counting fingers at $\frac{1}{2}$ metre eccentrically, that in the left 5-12. As the presence of an intraocular growth was thought probable on account of the gradual diminution in vision, the sudden onset of the glaucomatous symptoms, and the absence of any signs of glaucoma in the fellow eye, the patient was advised to enter the hospital for the removal of the eyeball. Her consent was readily obtained, and the globe was enucleated without further delay. Healing was normal, and she was discharged, but died suddenly nine weeks after the operation. There had been no local recurrence, and only a vague history of pain in the head and in the right side, shooting upward to the right

*Read before the Pathological Society of Philadelphia, May 10, 1900.

shoulder, could be elicited. The diagnosis of "heart trouble," made by the doctor who was hastily summoned at the time, was accepted by the Coroner, and no autopsy was made.

The eyeball was placed in Muller's fluid at the time of enucleation, and remained in the hardening fluid about twenty-six months. It was then thoroughly washed, and after being frozen in a mixture of ice and salt was divided carefully in the horizontal meridian, the section passing through the center of the cornea and the optic nerve. One-half was bleached for several days in a 5 per cent solution of chloral hydrate and mounted in glycerin jelly as a macroscopic specimen, according to the Priestley Smith method, which has already been described in a paper by one of us before this Society (December 12, 1895). The other half was dehydrated in alcohol of slowly increasing strength, imbedded in celloidin, and the sections, which were made parallel to the cut surface, were subsequently stained with hematoxylin and eosin and by the Weigert nerve-sheath method.

Macroscopic Description. The globe measured 24 mm. in the antero-posterior, 24.5 mm. in the horizontal, and 24 mm. in the vertical diameter. Upon sectioning, the retina was seen to be detached and folded up in the form of an umbrella, extending from the nerve to the posterior surface of the lens, and thence to its attachment at the ora serrata (see Figure 1). The subretinal space was occupied by an albumi-



FIG. 1.

nous exudate. The lens was pushed forward, pressing the iris against the cornea and completely obliterating the anterior chamber. The ciliary processes were pressed flat against the corneo-scleral junction. The cause of the retinal de-

tachment and of the anatomical changes which had given rise to the glaucomatous symptoms was revealed in the presence of a new growth springing from the choroid, on the temporal side, beginning at the equator and extending as a low, slightly pigmented mass, along the posterior part of the eyeball to a position 3 mm. to the nasal side of the optic nerve entrance. Beyond this point there was a series of small deposits of tumor cells which reached almost to the equator. The greatest elevation of the mass, which was at a point just posterior to the equator, on the temporal side, was but 2.5 mm. The growth extended along the inner surface of the sclera 22 mm., so that its shape was that of a low, flattened pancake, embracing the posterior outer quadrant of the globe.

Microscopic Examination. The microscopic examination shows these anatomic changes in detail, and the eyeball presents several points which make the case of special interest from a pathologic stand-point and worthy of careful study.

Cornea. The changes in the cornea, as in the iris and ciliary body, may be attributed to the increased pressure and to the edema of the tissues of the anterior part of the globe, as a result of the glaucomatous condition. The epithelium shows minute spaces between the individual cells, as well as between the cells and Bowman's membrane. The episcleral tissues are likewise edematous, the vessels are widely distended with blood, and are surrounded by collections of mononuclear round cells.

Iris. The iris is pushed firmly against the cornea, to which it is in part adherent, so that the endothelial lining of Descemet's membrane is interrupted. The angle of the anterior chamber is thus completely obliterated, and this channel, which provides for the outflow of the intraocular fluids, is blocked. The iris stroma is atrophic, the vessel walls are thickened, showing hyaline change, and the majority of the lumens contain a homogeneous fluid instead of blood corpuscles. The connective-tissue cells do not stain well, and the fibers are swollen and edematous. There is no trace of the sphincter muscle, the cells of this portion of the iris have disappeared, and nothing remains but irregular masses of tissue, which stain diffusely with the acid stain. The pigment layer on the posterior surface is thickened and separated into several laminae by a homogeneous exudate which fills the posterior chamber and is continuous with the exudate beneath the retina. The anterior capsule of the lens is covered with a number of fine pigment deposits, and numerous pigment granules and cells are scattered in the exudate between the lens and iris. The lens shows beginning cataractous formation, splitting of the fibers, collection of fluid between the

spaces thus made, and the conversion of some of the fibers into various sized globules. The nucleus of the lens is quite dense and is partly stained by the hematoxylin, forming a marked contrast with the rest of the lens substance.

Ciliary Body. The ciliary body is flattened and atrophic. The muscle fibers, especially the radial and circular, have largely disappeared, and the intervening connective tissue is swollen and edematous. There is considerable round-cell infiltration, irregular pigmentation, and the vessels have undergone the same changes as those of the iris. On the temporal side the ciliary processes are pressed forward, the lining cells are vacuolated, and the pigment is irregularly proliferated. Notwithstanding this, the processes have retained their form fairly well. On the nasal side, however, on the side opposite the position of the choroidal tumor, the processes have lost their normal shape and have been converted into a mass of necrosed tissue, which presents no regular layer of cells, but a mass containing a few faintly staining nuclei and dense pigment clumps. The corresponding part of the ciliary body shows an unusual amount of round cells,

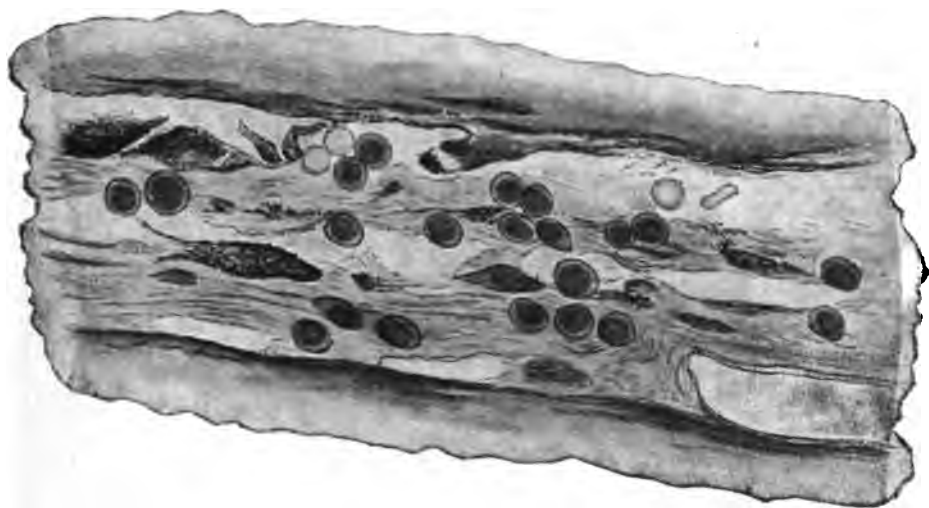


FIG. 2. Section of the choroid at some distance from the tumor, showing proliferation of the endothelial cells in the vessels. Plus 925.

and the cyclitis and edema of the tissues has been followed by complete degeneration of the part.

Choroid. This membrane is infiltrated anteriorly with round cells in several places, and at a distance quite removed from the tumor mass there are distinct evidences of proliferation of the endothelium of the vessels in the outer layers of the choroid (Figure 2). This becomes more evident in the

neighborhood of the growth, and can be traced also on the opposite side of the globe. The origin of the tumor is from the larger vessels of the choroid, as the smaller capillaries beneath the lamina vitrea pass with the latter over its surface. The larger part of the mass is composed of cells which are distinctly endothelial in type—large, round, or polyhedral cells, with considerable protoplasm surrounding the comparatively pale, round, or oval, centrally situated nucleus. These cells are massed closely together, with but little intercellular substance, and are separated into distinct alveoli by a delicate stroma composed of pigment cells, in which the capillary vessels run. This characteristic arrangement is present everywhere, except in the portion of the growth situated to the nasal side of the nerve, where the cells are more of a mixed



FIG. 3. Section of the growth showing the marked degeneration changes in the cells. Plus 925.

type, and include many spindle forms. In addition to their arrangement, the cells are also interesting by reason of the pathologic changes which they present (Fig. 3). Many of them are swollen, and the protoplasm shows extensive vacuolization, with degeneration of the nuclei. Some of the cells are enormous in size, being three and four times their normal

diameter, and the entire cell body is occupied by a series of small or by one large vacuole, which has caused the complete disappearance of the nuclei. Many of them are polynuclear. The pigment in the growth is represented by that in the stroma separating the cells into alveoli, so that the mass is not densely pigmented in any portion. In addition to the main tumor mass, there are many collections of cells outside the lamina vitrea of the choroid. Some of these are free in the subretinal space; others are covered with a layer of retinal pigment cells, which they have pushed before them in their growth. All of these collections show precisely the same type of cells. The exudate between the tumor and the retina contains also numerous red blood-corpuscles, degenerated retinal pigment cells, and wandering cells which have taken up the blood pigment.

Retina. This membrane is completely detached and is degenerated throughout. The layers are irregular, the supporting fibers are thickened and edematous, the ganglion cells have disappeared, and the rods and cones are disintegrated. It is attached only at the nerve entrance and at the ora serrata, and shows no infiltration with the tumor cells. Anteriorly it includes between its surface and the posterior capsule of the lens the shrunken and coagulated remains of the vitreous. The latter contains many swollen and degenerated connective-tissue cells, some of which resemble fat cells, as the nucleus has been crowded to the extreme periphery of the cell by the vacuolization of the cell body.

The changes in the optic nerve are also of very considerable interest. It is not infiltrated with tumor cells, and the connective-tissue septa are entirely normal. Although macroscopically a section stained by the Weigert method appears normal, when submitted to the microscope, the sheaths of the nerve fibers are seen to have lost their continuity and to have been converted into innumerable fine drops, which retain their position between the septa, and do not lose their color in the differentiating solution. The sections resemble the appearance of a Marchi preparation of an acute degeneration very closely, and indicate the conversion of the myeline sheaths into minute droplets.

The inner portion of the sclera shows beginning infiltration with the sarcoma cells, as is commonly the case in the low forms, but no epibulbar nodules are present.

In general appearance the growth resembles that which was presented by Drs. de Schweinitz and Steele before this Society at a recent meeting. As these gentlemen observed at that time, low flat forms of choroidal sarcomata are not the usual type under which these growths occur, although a sufficient

number have been reported to prevent their being considered a rarity. Alveolar sarcomata, endotheliomata, or intravascular, as opposed to peri-vascular, angiosarcoma of the choroid are, however, by no means frequent. The first one reported (Martens, Virchow's Archiv, Bd. cxxxviii.) was very similar to ours, except that the alveolar portion of the growth was but a small part of the whole. Although the cells of these tumors resemble epithelial cells very closely, it is manifestly incorrect to speak of them as carcinomata, as has been done by Wedl and Bock. It is well known that the choroidal sarcomata develop either from the cells of the adventitia of the choroidal vessels, or from the pigmented cells of the stroma, and that, according as one or the other form predominates, the growths are more or less deeply pigmented. Almost invariably, however, the endothelial cells of the vessels also proliferate, and it is probable that in these alveolar forms the greater mass of the tumor is formed by the direct proliferation of the endothelial cells. They cannot, therefore, be considered as carcinomata, for the cells are direct descendants from the connective tissue cells.

In conclusion we desire to call attention to the following points of interest in the case:

1. The rather unusual form of the growth, the greater part of which is alveolar in type (intravascular angiosarcoma), and has developed from the lining endothelial cells of the choroidal vessels.

2. The early appearance of the glaucomatous phenomena. This is common in the low forms of sarcomata, partly because of the large area of choroid occupied, and also because of the early involvement of the supra-choroidal space and the disturbance of the lymphatic channels.

3. The marked inflammatory changes and hyaline degeneration in the iris and ciliary body, due to the extensive degenerative process in the cells of the tumor.

4. The acute degeneration of the optic nerve.

5. The advanced age of the patient, seventy years. The majority of cases occur between the age of thirty and sixty.

The subsequent history of the patient is indefinite, but is suggestive of possible metastases in liver and brain.

May 10, 1900.

EXPERIENCES IN THE USE OF HOMATROPIN AS A CYCLOPLEGIC.*

BY EDWARD JACKSON, A. M., M. D.

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RELIABILITY AS A CYCLOPLEGIC.

Homatropin is a cycloplegic of the greatest practical value. The meagre evidence on account of which some have rejected it, becomes more and more insignificant when compared with the accumulating experience of those who habitually employ it for the measurement of errors of refraction.

Of course it can be used so as not to produce complete cycloplegia. Moreover, it does not possess any such surplus of cycloplegic power as do atropin, duboisin, and the other drugs of that class. These in their ordinary solutions may be used carelessly, so as to waste much of their cycloplegic power, and still produce full cycloplegia. But homatropin cannot. We may prescribe an atropin solution 1 to 120 to be used three times a day; and although two of the three instillations may be quite ineffective, the cycloplegia may be complete and continuous. But with homatropin each application must be made effective.

The following experience illustrates the reliability of homatropin as a cycloplegic. Among the last one thousand patients with whom I used the drug, there were twenty-two in whose cases the completeness of the homatropin cycloplegia was so suspected that immediately afterward, or within a few months, the eyes were subjected to one of the stronger mydriatics. Of these forty-four eyes only six showed higher hyperopia, or lower myopia, under the stronger mydriatic. The ages of these patients, and the errors of refraction as found with each of the mydriatics, are given below:

AGE	HYPER.	HOMATROPIN.	ATROPIN.
23	Rt.—6.	—0.62 Cyl. Ax. 60°	—5.50 —0.75 Cy. Ax. 60°
	Lft.—5.25	—0.50 Cyl. Ax. 120°	—5. —0.50 Cy. Ax. 120°
19	Rt.—0.50	Cy. Ax. 170°	+0.25 —0.50 Cy. Ax. 165°
	Lft.—0.25	—0.75 Cy. Ax. 20°	—0.50 Cy. Ax. 25°
21	Rt.+0.37	+0.75 Cy. Ax. 90°	+0.50 +0.87 Cy. Ax. 90°
40	Rt.+0.50	+0.62 Cy. Ax. 90°	+0.87 +0.87 Cy. Ax. 93°

The subsequent review of the refraction under another cycloplegic is but one test of the completeness of the cyclople-

*Read before the Denver Ophthalmological Society of Denver, Colo., October 16th, 1900.

gia produced by homatropin. The absence of any increase of hyperopia under the prolonged wearing of the homatropin correction is an evidence which some rank as of higher importance. And the most important practical test of all is the completeness and permanence of the relief afforded by the correction of the ametropia found under homatropin. Tried by both of these tests, also, this drug has proved itself a reliable cycloplegic, and, as I have used it, decidedly more reliable than atropin, when instilled in the usual way by members of the patient's family.

SPECIAL VALUE IN CHILDHOOD.

It is often stated that as homatropin is a feebler cycloplegic, it may be employed with more confidence for patients who, having reached or passed the age of forty years, possess a lessened range of accommodation. This is probably incorrect. The following two cases are fairly illustrative of my experience in this direction.

Mrs. C., aged 40, came on account of headaches and oversensitiveness of the eyes to light. Under five instillations of a 3 per cent solution of homatropin, the following correcting lenses were required:

Right. $+0.50 \text{ Sph.} \ominus +0.62 \text{ Cyl. Ax. } 90^\circ$
 Left. $+0.50 \text{ Sph.} \ominus +0.62 \text{ Cyl. Ax. } 85^\circ$

But after six weeks' wearing of these lenses she was still not relieved. She then used atropin solution, 1 to 120, three times daily, for seven days, when the following lenses were required to correct her ametropia:

Right. $+0.87 \text{ Sph.} \ominus +0.87 \text{ Cyl. Axis } 93^\circ$
 Left. $+0.50 \text{ Sph.} \ominus +0.62 \text{ Cyl. Axis } 50^\circ$

Miss H., aged 16, came with eyes that "had always been weak," and were worse after use for study. Her vision was 4-3 partly, and she was using weak convex lenses obtained from an optician. She had esophoria 3 centrad for both distant and near seeing. Five instillations of a 3 per cent solution of homatropin left her eyes corrected by the following:

Right. $-0.25 \text{ Sph.} \ominus -0.25 \text{ Cyl. Axis } 155^\circ$
 Left. -0.50 Sph.

These gave vision of 4-3 full; but I was not satisfied, and placed her upon the use of atropin solution 1 to 120. After using this for five days, there had not been the slightest change in the refraction of either eye. The above lenses were ordered for constant use and gave prompt relief.

The difference of 0.62 D in one meridian of the right eye of the first patient is the greatest increase of hyperopia I have

found in any case, by the use of atropin after homatropin. It occurred in a woman of forty, while with the girl of sixteen, from whose esophoria and previous wearing of convex lenses there was reason to distrust the findings with homatropin, the use of the atropin entirely confirmed them.

Greater difficulty in overcoming spasm of the ciliary muscle at 40 than at 16 is the opposite of what is usually taught. But it might reasonably be expected from a consideration of the factors involved; and is quite in accord with my previous experience.

Among the 52 eyes submitted to homatropin, and then to one of the stronger cycloplegics, which I reported upon in the *Medical News*, July 24, 1886, there were 26 of patients under 18 years of age; and of these only 3 showed increased hyperopia or diminished myopia, and only 0.25 D. in each case. But of the 26 eyes of patients ranging from 18 to 29 years of age 5 showed increased hyperopia under the stronger cycloplegic, amounting in one case to 0.50 D. Of the 22 patients reported upon in the beginning of this paper as subjected to the same test, 9 were under 18 years of age; and in none of these did the stronger cycloplegic show higher hyperopia or lower myopia than appeared under homatropin. The 13 other patients ranged from 19 to 42 years of age; and among their 26 eyes were 6 that showed higher hyperopia, or lower myopia, under the stronger cycloplegic.

Combining the two series of observations, we have 96 eyes subjected to a stronger cycloplegic immediately after the use of homatropin, or after such a short interval as to make it very improbable that actual change in the static refraction of the eye should have taken place. Of 44 eyes of patients under 18 years of age only 3 showed increased hyperopia, or diminished myopia under the second drug. But of 52 eyes of patients over that age 11 showed increased hyperopia, or diminished myopia, under the stronger cycloplegic.

This point may be brought out in a different way. Among these 48 patients, the average age of those in whom homatropin had revealed the true static refraction of the eye was 18 years. The average age of those in whom homatropin had failed to reveal the true static refraction of the eye was 21.1 years.

These observations regarding the efficiency of homatropin at different times of life seem in accord with what I pointed out with regard to the latency of hyperopia. (Trans. Section on Ophthalmology of the American Medical Association, 1892, P. 51.) I found that under 20 years of age a part of the hyperopia was latent in about 21 per cent of hyperopic eyes. But that at 40 years 32 per cent of hyperopic eyes

showed some hyperopia latent; and at 45 and 50 the percentage was still higher.

If once we can get rid of the error that latency of hyperopia is constant or specially common in childhood or youth; it seems reasonable to expect that the more rapid mydriatic attack of homatropin should prove relatively more effective in children, in whom elimination is more rapid; and that spasm of accommodation should yield more slowly in older persons, requiring, therefore, the more prolonged influence of atropin.

METHOD OF APPLICATION.

Since homatropin lacks the surplus of cycloplegic power possessed by some of the other mydriatics, it is of especial importance to get it applied in the most effective manner. The object is to get as much of it as possible absorbed by the cornea in the brief period, one or two hours, before the effect of that first applied begins to diminish. The gelatine disks of homatropin and cocain, introduced by Dr. C. A. Wood, I have not habitually employed, because I prefer not to disturb the cornea with cocain; and I am not convinced that the application of two or even three of these disks can be relied on, quite as fully to produce complete cycloplegia, as can the solutions I have employed.

The solution has a strength of 1 to 30, or 1 to 40, of homatropin hydrobromate in distilled water. The patient is directed to look rather downward. The upper lid is slightly raised and steadied with one finger, and a small drop, usually less than a half-minim, is placed at the upper margin of the cornea. The eye is then kept open for 15 to 20 seconds, and until the patient by holding open the other eye shows he has regained control of the lids. This is repeated every five minutes until 4 to 6 instillations have been made.

If decided lachrymation is provoked, the drug must be instilled a greater number of times. To avoid this the solution should be quite devoid of irritant properties. From some specimens of homatropin hydrobromate it is quite impossible to get a non-irritant solution. This must be looked to. The disturbance caused by the instillation can also be reduced, bringing the drop to about the body temperature, and taking care that it shall not fall any distance before striking the eye. The blandest solution of homatropin will cause marked pericorneal hyperemia during the time it is being absorbed through the cornea. But this will not necessarily be accompanied by any discomfort, increased lachrymation or other evidence of irritation.

CONSTITUTIONAL SYMPTOMS.

The amount of the solution commonly applied to both eyes to produce cycloplegia has contained one-sixth to one-fourth

of a grain of the drug. If more than this was used, the excess escaped in the overflow of tears, and being wiped away was not absorbed. This amount has very rarely produced any constitutional symptoms, that were noticed by the patient or his friends. Patients often speak of dizziness, and with the disposition to close the eyes, there may be drowsiness. But these are felt chiefly during the rapid dilatation of the pupil and weakening of the accommodation; and often pass off entirely before the full amount of the drug has been absorbed, or even instilled. They are probably due to the changes being produced in the eye, and not caused by any general toxic action of the drug.

In the paper already referred to, are detailed the symptoms produced by one-eighth to one-fourth of a grain of the drug, taken hypodermically. There was always some intoxication, disturbance of thought, sensation and co-ordinated movements, together with disturbance of the pulse-rate. There was first a slowing of the pulse, then a quickening toward, or even above the normal; then a second slowing, and finally a return to the normal. There is every reason to think that some such disturbance of the pulse-rate usually attends the use of homatropin as a cycloplegic. I have failed to observe a slowing of the pulse when it was watched every few minutes during the first hour after commencing the cycloplegic use of the drug. It was noted sometimes when the total amount of the drug instilled was not over one-fiftieth of a grain. But unless the amount used was much larger than this, no secondary rise and subsequent fall of the pulse-rate was noted. Impairment of the heart's action, or symptoms of embarrassment of the circulation from the use of homatropin have never been noticed.

In but very few cases have any symptoms of homatropin intoxication been certainly manifest, after the use of the drug in the manner above described. The following cases are the most marked that I have encountered. They both occurred in Denver, and from the use of different samples of the drug which induced in other persons only the ordinary physiological effects.

Mr. R., aged 38, received five instillations in each eye, containing altogether about one-quarter grain of the drug. No constitutional effect was noticed until the testing of his eyes was about completed. He then staggered perceptibly in walking, and said he felt as if he had taken several drinks of whiskey, and had a tingling all over, to the ends of his fingers. Returning to his place of business, his partner noticed his condition and got him to lie down. At the end of four hours he could walk steadily and felt all right.

D. S., aged 11, had six instillations in each eye, making in all about one-quarter grain of the drug. Soon after the last instillation she moved awkwardly and dragged her feet in walking, and was noticeably inclined to stumble. She "felt queer" and seemed dreamy; but she understood and answered promptly when questioned. An hour later she was better, went home over a mile alone, and no symptoms were noticed after she arrived there.

TASTE.

The one extra-ocular symptom that is encountered in a large proportion of cases, after the instillation of homatropin, is the bitter taste in the mouth. Occasionally it is entirely absent. In some cases it does not appear for a half hour, or even an hour after the first instillation; and may then pass unnoticed unless special inquiry is made about it. But mostly it is noticed sooner than this. Sometimes the patient has asked if the drops could get into the mouth within a minute after the first instillation. When it appears early the taste is apt to be strong and disagreeable. It is most annoying when excessive lachrymation is excited by the instillations.

In a few cases the drug is distinctly felt in the nose, causing a sensation of dryness, or the feeling that the nostrils are obstructed. This is noticed a few minutes before the bitter taste. This nasal disturbance, and the bitter taste, always pass off within an hour or two after the last instillation, but so gradually that it is impossible for the patient to fix a definite time.

SUMMARY.

Homatropin Hydrobromate, properly used, is a reliable and satisfactory cycloplegic.

It is quite as sure to produce complete cycloplegia in children as in those who have reached the age of forty years.

The preferred method of applying it is in two and one-half or three per cent solution; a small drop being placed at the upper corneal margin, every five minutes, until 4 to 6 drops, or rarely more, have been instilled. Care should be exercised to produce the least possible irritation by the instillations.

Homatropin very rarely causes any noticeable symptoms of mydriatic intoxication, far more rarely than any other cycloplegic. The only common extraocular symptom is the bitter taste.

VERNAL CONJUNCTIVITIS.*

BY L. WEBSTER FOX, A. M., M. D.,

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There is a rare form of conjunctival inflammation, very difficult to properly classify and name, because this disease is different from any of the other known types. With the approach of warm weather the symptoms develop, becoming more pronounced with the increase of temperature, only growing less pronounced with approaching cool weather. In this it resembles hay fever or rose cold. This disease is characterized by excessive itching, conjunctiva slightly swollen and of a bluish pink tint, folding or doubling over on the cornea—no pain is evidenced, excepting an intolerance of light. The disease usually affects both eyes, but particularly characteristic is the course it runs and its recurrence every spring and summer. The environment and general health of the patient does not enter as a factor in the disease. The five cases which I have seen during the last fifteen years, were in good health and the surroundings were all that wealth and comfort could give. This disease is very rare in this country, in fact, it is not common anywhere, yet it has received considerable attention from ophthalmic surgeons, probably on account of its annoyance to patients and the discouragement of treatment. It has many names—Vernal Catarrh or Saemisch's Disease, Phlyctena Pallida (Hirschberg), Hypertrophie Perikeratique (Desmarres), Conjunctivitis Verrucosa (Goldzieher), Fruehjahr's Catarrh or Sommer (Summer) Conjunctivitis. To me the term vernal conjunctivitis is the most acceptable—vernal which means spring, would distinctly indicate the most characteristic feature of the disease, the exacerbation in the first few hot days in May or June.

My attention was first called to this disease while a student in Berlin. Once seeing a case and hearing the history of its sudden appearance you will never make a mistake in the diagnosis. It is as characteristic in Berlin as in Vienna or Philadelphia. I cannot recall seeing a single case at Moorfields Eye Hospital, London, during a two years' term of professional service in that institution, and where twenty-three thousand new patients were registered annually. Since my

*Delivered to the students of the Medico-Chirurgical College.

return to this country I have had the opportunity of seeing, in round numbers, fifty thousand patients at the various hospitals to which I have had the honor to be connected (German-town, Jefferson and Medico-Chirurgical) and in private practice, and strange as it may seem to you the five patients which have come under my observation and treatment have all come from the well to do class.

It can be confounded with catarrhal conjunctivitis to the non-observant—the palpebral conjunctiva presents in the recurring stage, symptoms of catarrhal conjunctivitis with slight mucous secretion. As this disease develops in the retrotarsal fold the conjunctiva becomes greyish-red and has a flaky appearance even after the secretions have disappeared. In two of my cases a mushroom-like protuberance spread over the ocular conjunctiva, particularly on the temporal and nasal side of the cornea.

The excessive itching of the eyeball is the most characteristic symptom and lasts for weeks. The constant rubbing in the effort to gain relief increases the injection and the swollen conjunctiva assumes a bluish-pink tint around the cornea and it is with difficulty that the eyelids can be kept open. This pitiable condition lasts during the heated months, only changing in degree as the weather grows hotter or cooler. It disappears as rapidly as an attack of hay fever, a drop of the thermometer to 65 degrees will cause a cessation of all irritation or swelling, and if the cool weather continues for three or four days all symptoms disappear in an astonishing degree. It might be supposed that the similarity of the attack between this disease and hay fever or rose cold would have some connection with nasal affections, but none of the cases under my care had any trouble whatever.

My friend, Dr. William M. Capp, speaks of it, as follows: "Like hay fever and rose cold, its periodicity is marked in those individuals who are subject to its attacks, and there is no special evidence of epidemic character or of contagiousness. Starting when the spring of the year has well set in, the season from which it gets its name, it runs a course of gradual exacerbation, with slight remission and with but little response to local treatment, until under the influence of the return of season of frost, it slowly disappears."

One of the best reviews on this subject is from the pen of a distinguished Russian ophthalmic surgeon, Dr. Alexander Natanson, who speaks about it, as follows:

"Vernal conjunctivitis is an extremely rare disease in Russia, much more so than in any other country with an even more temperate climate than that of Central Russia or especially of the southern tropically hot regions, including our Asiatic

possessions. The etiology of the disease does not depend upon the absolute temperature only, it seems that humidity, temperature changes, etc., play an important role too. How could we otherwise explain the prevalence of this disease in Turkey, Italy, etc., and the comparative absence of it in Southern Russia, although they are all situated in the same meridian. In Constantinople, especially around the lakes of Switzerland and on the Rhone, we see the same thing. It appears that our climate does not favor the development of this disease regardless of immense changes in the temperature which changes culminate in a very cold winter and an extremely hot summer. It might be supposed that the disease is more frequent and simply wrongly diagnosed. In opposition to this view I wish to state that diagnostic errors cannot be frequent, because the disease is recognized occasionally, and because most of our specialists have received their education abroad, and would naturally at once recognize a disease seen before; even if the case was not diagnosed correctly at first, further observation would positively clear it up—in the latest literature, the fact is mentioned that the disease appears exclusively in connection with nasal affections. But as nasal affections are just as prevalent in Russia as in Western Europe, this causation seems to be at least over-estimated. I do not hesitate to announce my theoretical opinion that histologically this disease is of epithelial origin because it heals without the formation of scar tissue. Where there are connective tissue granulations there must follow scar tissue, and where there is no scar tissue there could have been no formation of connective tissue. Typical cases will generally show points which make the differential diagnosis comparatively easy, but a solitary case, seen especially by those who have never seen a case of vernal conjunctivitis before, will be very difficult of diagnosis, in such case a specialist who has seen thousands of cases of trachoma could simply state that he is not dealing with a trachoma.” *

Where is the disease located? From my observation as the result of the treatment which has cured the patients permanently, I fully agree with Dr. Natanson that it is a disease of the epithelium of the ocular conjunctiva which must be in my judgment, destroyed to bring about permanent relief.

TREATMENT.

My first patient, seven years of age, consulted me May 6th, 1886, with a history that during the first warm days in April, for the last four years, has had an inflammation of both eyes

[*Translated by Dr. Alexander Klein, Philadelphia]

associated with intolerable itching, lachrymation and photophobia, intolerance of light. The conjunctiva is of a pale blue tint, markedly hyperemic, slight pericorneal infiltration, some few granulations scattered over the ocular conjunctiva, slight mucous discharge, eyeballs heavy, with slight discoloration of epidermis over the eyelids, evidently the effect of the rubbing. The patient did not complain of much pain in the eyeballs, and did not suffer much from the photophobia, but the itching of the eyeballs was beyond endurance. I prescribed the following eye lotion, which was to be applied constantly cold :

Acidi borici.

Sodii chlor. aa grains 20.

Aq. menth, pip., drachms 4.

Aq. camph.

Aq. destil., aa ounces 2.

M. ft.

This seemed to relieve the itching and gave a certain degree of comfort as long as it was applied. Then internally I give Liq. potas. arsenit. five drops, three times daily. On May 30th I changed the remedy to boroglyceride, 50 per cent solution—the lotion seemed to have lost its effect. One drop of boroglyceride was applied every hour during the day, and the lotion at night—this treatment gave relief during the hot weather. The patient returned on March 22, 1888, with an attack of the same affection. The attack came on a few weeks earlier than usual on account of warm weather. The treatment of last year was applied and kept up during the summer. The following year the attack did not appear until May 15th, in addition to the former treatment mild nitrate of silver, grain one-half to the ounce, three times weekly for six weeks—this seemed to abort the attack in April and May, as the inflammation did not appear until July, when pyoktanin was used, which seemed to allay the irritation for that summer.

The guardian of the patient, at the outbreak of the attack the following year, discouraged with my treatment, sought professional advice elsewhere, changing her ophthalmic surgeon each succeeding year, until June of 1895, when I was again consulted. As the patient was financially able to secure the best skill of our country, which was done, and all methods of local treatment exhausted and permanent relief not obtained, I advised grattage, which had been so successful in my hands for the treatment of trachoma.

The operation was performed on both upper and lower eyelids, as well as over the ocular conjunctiva, being extremely careful not to injure the cornea. The reaction from

this operation was almost nil, the patient recovered rapidly and the conjunctivitis entirely disappeared, all the irritation left, and for the first time in years the patient spent a comfortable July and August.

The conjunctiva of the eyelids and eyeballs took on a different aspect—having lost its velvety appearance, and in its place was a thin blue transient tissue quite elastic, which acted quite as naturally as normal conjunctiva—I looked forward to the following year with considerable anxiety as to whether my radical treatment was to be permanent. I am pleased to say that it was, and no outbreak has since occurred. The young lady is now twenty-one years old, and has perfect vision and eyeballs are, to all intents, normal.

Having had such excellent results in this case, I applied the same treatment to four other patients. Two in 1896, one in 1897, and the fourth in 1898. I have all of the cases return periodically for inspection, and the treatment has been eminently successful. In the last cases I simply applied the grattage to the eyelids and retrotarsal folds. They have been free from the disease, so in the future I shall simply follow out this procedure, as follows:

The upper eyelid is grasped along its margin by forceps, and the edge being turned upon itself the lid is rolled up until the retrotarsal fold is brought out. The exposed part is now thoroughly scarified with a three-bladed scalpel, not only horizontally, but vertically. The granular tissue is then scrubbed with a brush, which has been steeped in a corrosive sublimate solution, one to five hundred, just before being used. Immediately after the scrubbing, the part is washed with a solution of the same strength. Another part of the lid is then unrolled, and the scarifying, scrubbing, and washing are repeated, and in like manner the whole of the eyelid. The lower lid is then similarly treated, and if necessary, the operation is extended to the other eye. In cases of vernal conjunctivitis I have never performed this operation but once on an eyelid.

Among the local remedies which I applied and secured relief for a short time (it must be remembered that patients when they learn what a radical operation really means, will not always give their consent, then we must have other resources at hand) is Hydrarg ox. flav. and Ichthyol ammon., each one-eighth grain, and Ung. petrolei, one drachm—this is to be followed by applications of Chinosol, 1 to 2,000, applied three or four times daily. Each case being a law unto itself, requiring different treatment for each individual, so that the whole pharmacopeia is exhausted without obtaining permanent results.

CONCERNING THE DEVELOPMENT OF ASTHENOPIA AND ERRORS OF REFRACTION.

BY DR. CARL SCHULIN.

HELENA, MONT.

It seems to be taken for granted that the sclera does not affect the refraction of the cornea. The eye-ball is usually looked upon as a photographic camera. Only the power of the refracting apparatus and its distance from the receiving plate, not the hull, is taken into consideration. Most authors overlook the fact that the eye has no rigid walls, and that the sclera is only a flabby sac. This sac maintains the shape of a ball, from its liquid contents, as the soap-bubble does from the air with which it is inflated. The cornea, one of the most important refracting media, has its spherical curvature only from its being a part of the ball-shaped hull of the eye. Therefore, any change of the latter, from inside or outside influences, must affect the cornea, and through it, the refraction of the eye. The eye would have as perfect a ball-shape, as the soap-bubble, if it were suspended, free in space, and if its contents were uniform and stable. The peculiar way in which the eye ball is attached to the human body, however, and the manifold variety of its contents, which are even, through the circulation of the blood, in free communication with the outside, open many chances for alteration of its shape.

By far the greatest part of the inside of the eye is occupied by a gelatinous ball—the vitreous body with the lens. If this be removed from the eye and laid on a plate, then, by its own weight, it sinks down and assumes the shape of a round button, the lens always succeeding in reaching the top of the button, and remains in the middle of its upper surface. Compared with the position on the plate, the vitreous body, inside of the eye, rests on the side, and the lens stands upright on its margin. As the vitreous body does not fill out completely the hull of the eye, it will also, by its own weight, be inclined to sink down and to impart to the flabby sclero-corneal sac the shape of an ellipsoid standing upright on one of its poles. Like an orange, it has a longer diameter at the equator, than from pole to pole.

This change of the shape of the eye will produce on the cornea what is known as “astigmatism with the rule.” It

is counteracted by three factors, which are both internal and external:

First, the lens which is attached to the vitreous body as well as to the sclera, and implants into the equator of the former a spherical surface, at the point which has the greatest importance for the formation of images on the retina. Second, a cause leading to the same effect would be high fluid tension in the lymphatic space around the vitreous body; the tension might therefore be higher than compatible with the free circulation of the blood in the retina. This would not have to be feared from the third factor, the action of the extrinsic muscles of the eye, especially the external and internal recti: They embrace the eye-ball with their flat bellies and their membranous tendons, exercising a mild and equal pressure, thus, they support and strengthen the sclera, and are well able to counteract the weight of the vitreous body, without increasing intraocular tension.

When over-exerted, the external and internal recti might even produce "astigmatism against the rule," changing the shape of the eye-ball to the shape of an ellipsoid with a shorter diameter at the equator than from pole to pole—like the lemon. In a similar way, the superior and the inferior recti when working together, would tend to produce "astigmatism with the rule," and the oblique muscles might, by combining their action, with the recti, produce an astigmatism with inclined axis.

Such muscular action may also have some influence upon the lens. By changing the line of insertion of the zonula Zinnii from a circular to an elliptic shape, the zonula might be relaxed in one direction, and according to the now prevailing theory of the accommodation, the lens might grow thicker in that direction only. Lenticular astigmatism may thus be added to the corneal astigmatism, both having similar axes. Some authors believe in partial contraction of the ciliary muscles, but partial contraction of a ring muscle on two opposite points, is a physiological impossibility.

In cases of corneal astigmatism the cornea is generally believed to have a circular curvature in two directions which stand at right angles to each other, with radii of different length. It seems to me that the curvature is only in one direction, circular; in the other one, elliptical. The circular curvature is at the equator of the ellipsoid. Its position on the cornea indicates the "axis of the astigmatism." The elliptical curvature stands at a right angle to it, and it is there where we try to make our corrections by cylindrical lenses with a circular curvature. In mixed astigmatism, not one of the meridians of the cornea can be circular, all are elliptical.

No living muscle, when at rest, is in a condition of perfect relaxation. There is always a certain, however small, amount of contraction. This so-called tonus of the muscle which is of varying strength, according to the health and other conditions of the individual, ought to have an effect on the eye, if it is of equal amount in all the four recti, as the globe is compressed against an adipose cushion behind, and has its axis shortened. Hypermetropia should be the result. If one pair of these muscles have more tonus than the other, corneal astigmatism would be the result, increased by lenticular astigmatism with the same axis. If one muscle of one pair has more tonus, than the other, strabismus would be the result. Close relation exists between the tonus of the eye muscles and the refraction, and also an analogy between astigmatism and strabismus, both being produced by deviation from the normal tonus.

The first principle in the construction of the eye of all vertebrates seems to be toward a ball-shaped sac filled with a clear medium with such an index of refraction that parallel rays of light are focused on the posterior pole. The first consequence of this principle is that the refraction is independent of the size of the eye. Some authors claim the eyes of children and of small animals are hyperopic, because their axes are short. These authors, I believe, are mistaken. The eye of the mouse and the eye of an ox will produce equally sharp images of distant objects on the retina, provided both are ball-shaped and have the same index of refraction.

The most simple eye of all the vertebrates is the eye of the fish. The ball-shaped lens fills out the whole sclero-corneal sac, and there is only one refracting surface. Writers on comparative anatomy agree that air-breathing vertebrates are descendants from fish. So it appears that in the course of evolution, the eye of the fish—which would be very near-sighted in air—adapted itself to present conditions. This change was brought about by the development of the vitreous body and the aqueous humor, which have much lower indices of refraction than the lens. It is a puzzle how nature succeeded in giving to the flat lens of the air-breathing vertebrates such a curvature that emmetropia resulted. Donders, (*"Anomalies of Refraction,"* edited by C. A. Oliver, Sec. vi), says: "The difference in eyes of different refraction is simply in the length of the axes," but he adds that "Hypermetropia might also be produced by too flat a lens."

According to the now generally accepted theory of accommodation of the eye to different distances, it is effected by an antagonism between muscular action and elasticity. As long as the ciliary muscle is at rest, the lens is, from the tension

of its capsule, under a constant pressure on its anterior and posterior surface. By the contraction of the ciliary muscle the inner part of the zonula Zinnii is relaxed and the lens is permitted to assume more curvature by its own elasticity. There is in the lens an antagonism between two elastic substances, the capsule and the body of the lens. Such an antagonism cannot be expected to work so perfectly as one of muscular action. Elasticity is a force, liable to weaken, when exerted too much. In a lifeless substance, like caoutchouc, the weakened elasticity cannot be restored, but in living tissues this might be different.

Therefore, it seems probable that the lens, after having been permitted repeatedly and for an extended time, to assume a greater thickness, will not yield quickly to the flattening influence of the capsule, when the ciliary muscle relaxes.

For illustration:—Take the eyes of the children in school. At the end of school hours one can easily determine by the ophthalmoscope as well as with the chart, that, normally existing hyperopia has in quite a few eyes been replaced by emmetropia or even a low grade myopia, which disappears again after a few hours or days. In many cases only the right eye is affected this way. This is generally considered as a spasm of the ciliary muscle and is called "Spasm of accommodation." If this view be correct, the pupil would be contracted in such cases, but on the contrary, it is always enlarged. And whoever heard of a healthy muscle getting a spasm from a little overwork? A much more plausible explanation of transient myopia is, that the lens, after having been permitted to remain more curved for some time, is slow in resuming its former shape.

The term "Spasm of Accommodation" should be banished from the refraction room. There is certainly a spasm of the ciliary muscle from disease or the effects of drugs, but it is never caused by ametropia. By a strange mistake the function of the capsule of the lens was mixed up with the work of the ciliary muscle, and the shortcoming of the former was taken for a spasm of the latter.

Thorington, ("Refraction and How to Refract," chapter vii.), in a very interesting thesis on the effects of the different mydriatics and cycloplegics, calls attention to the difference in the physiological action of homatropine in the child, and at the age of thirty-five. But, would it not be better to look for the cause of this difference in the capsule of the lens, than in the ciliary muscle? The softer body of the lens of a child of ten years has more elasticity than the harder lens of a man of thirty-five. Therefore, when the pressure from its capsule is relaxed, it will more quickly assume more convexity.

and, when the ciliary muscle relaxes, the delicate capsule will be slower in compressing the lens again.

The strongest and the quickest mydriatic is darkness; the strongest and the quickest myotic is light. Darkness need not be absolute, but in a large room with just light enough to see the walls, the accommodation is within a few minutes relaxed as well as this can be done in broad daylight with any mydriatic in an hour. The presence of a small kerosene lamp or a candle in such a position that its light does not strike the eyes of the patient, will do no harm.

The ophthalmoscope has been undeservedly charged with being unfit for refraction work without previous mydriasis, as it would be very difficult for the patient as well as the examiner to relax the accommodation under its use. The reason why this complaint was made, is doubtless that the ophthalmoscope is generally used in a small chamber with blackened walls only a few feet from the patient's eye, and with too strong light, as an electric light or a Welsbach burner. In a large darkened room, and with a small kerosene lamp, or a candle, one can test the refraction with the ophthalmoscope. The less light there is, the better. The shadow test requires strong light. No one can use skiascopy with a candle, and the unavoidable reflex irritation of the ciliary muscle from the retina by the strong light, created the opinion that the refraction could be tested accurately only after complete mydriasis has been produced.

With the shadow-test undoubtedly the refraction can be tested more accurately than with the ophthalmoscope, but the question arises, whether a little more accuracy or the many advantages which the ophthalmoscope affords, are to be preferred.

If the refraction be tested with the ophthalmoscope before and after cycloplegia has been instituted, only a very small, if any, difference, is found. Only in cases of hyperopic astigmatism greater differences are found, but these must be charged to the lens, not to the ciliary muscle. In healthy, normal nonastigmatic eyes the difference never amounts to more than one diopter, and this represents the normal tonus of the ciliary muscle. Frequently it is less than a diopter, indicating an insufficiency of the ciliary muscle. In cases of myopia or presbyopia there is no difference at all between both tests. A great difference should be expected in high-grade hyperopia, but it does not exist, if astigmatism be absent. Instead of spasm of accommodation, as many believe, high-grade hyperopia seems rather inclined to produce insufficiency of the ciliary muscle.

The so-called latent hypermetropia does not exist before the ophthalmoscope; it exists only before the trial-case and

the chart. A presbyope with +7.00 D. hyperopia accepts right away lenses +7.00 D. sph. for the distance, while a healthy child of ten years with +7.00 D. hyperopia accepts only +1.00 D. or less, but when you test both of these people with the ophthalmoscope, then you find the full amount of hyperopia, without needing a mydriatic, in the youngster as well as in the old aged. Apparently the opinion prevails that, in the child, the ciliary muscle is in proportion to the latent hyperopia spasmodically contracted, and must be paralyzed with a cycloplegic to reveal the full amount of the hyperopia, but this is erroneous. *The ophthalmoscope shows that as soon as the eye is put to rest, the ciliary muscle goes back to the zero point of its action, minus the tonus, nearly to the zero point of the absolute hyperopia.

The ciliary muscle of the hyperopic eye, when called into action, is accustomed to make greater exertions than the one of the emmetropic eye, and therefore when a lens is placed in front of the eye, it is liable to exert itself too much and produce artificial myopia. The young hyperope of high grade, after having been fitted with strong convex lenses, must learn how to use them. If he succeeds in learning it, then he does what the old folk do against their wishes in developing their presbyopia. He creates himself a premature, an artificial presbyopia, and to do this he needs the assistance of a pathological condition, a weakness of the ciliary muscle from disease. The development of this insufficiency, not the hyperopia, really caused him to go to the oculist; thousands of youngsters have high grade hyperopia without knowing it, and without showing it, except to the ophthalmoscope. Our aim should be to restore this condition and to maintain it as long as possible, during life; glasses should be only the last resort.

Donders, the discoverer of hyperopia, made the mistake in charging it with causing two eye troubles—asthenopia and strabismus. Donders looked at refraction as a mathematician, not as a physician. With great acumen, he recognized the difference between manifest, latent, and absolute hypermetropia, and the role which the ciliary muscle plays in each case. Besides, he saw a weakness of the ciliary muscle in asthenopia and an overexertion of the internal recti in strabismus; so he concluded to bring these things together as results of the hyperopia. Had he looked at the thousands of eyes which he examined, from the standpoint of a physician, observing how hypermetropia, asthenopia and strabismus, are distributed, then he would doubtless have avoided the mistake and would never have seen any connection between them.

Donders' successors, instead of discovering and correcting his mistake, made things worse. Donders spoke of "exertion" of the ciliary muscle in hypermetropia; they changed this to "spasm." Donders described asthenopia as a simple symptom of fatigue, and accentuated its not being connected with any pain. His successors soon connected it not only with pains in the eye, but with headaches, and some went even so far as to accuse hyperopia of causing all kinds of nervous trouble, neurasthenia, chorea, epilepsy and insanity. Donders never thought that hyperopia could do the eye any harm beyond making the ciliary muscle tired and turning the eyeball in co-operation with the internal recti. His successors, however, discovered that hyperopia causes conjunctivitis, blepharitis, phlyctenular and other keratitis, choroiditis, cataract, etc. They also contended that dyspepsia and liver trouble and all kinds of female diseases could be traced to hyperopia.

Instead of producing convergent squint, hyperopia seems rather, if not to be produced, at least to be increased by the squint, in the deviated eye. Prolonged non-use of an eye seems to have a tendency to lower its refraction. One can imagine that if the ciliary muscle is never contracted, the pressure of the capsule on the lens is never relaxed, and more flattening will be the result.

In cases of anisometropia where one eye is amblyopic, it has always more hyperopia than the other one. In one case, a young boy, an increase of the hyperopia, together with a decrease of the vision, in the course of a few years, was closely watched by me. E. G., of Livingston, Mont., at that time seven years old, had in November, 1898, in both eyes V. 20-60. The refraction of the right eye was +2.50, and in the left eye +3.50. He has now in the right eye V 20-50, with a refraction +2.00, and in the left eye V. 20-150, and a refraction +5.00.

A large number of people who have full sight in both eyes, use only one, nearly always the right eye, for close work. The non-use of the left eye is probably the first cause of the development of anisometropia, and the reason why in such cases the left eye is always more hyperopic than the right.

About asthenopia, Donders says (Section ci. and following): "Asthenopia manifests itself as a fatigue symptom. The eye is not diseased and is not painful. Distant vision is perfect, but reading causes a sensation of tension over the eyes. Rest relieves. Its cause has by some been looked for in the retina, by some in the organs of accommodation. I have shown that it is not an accommodation anomaly, but one of refraction, namely, a definite degree of hypermetropia."

Donders clearly describes the symptoms of fatigue—or insufficiency of the ciliary muscle—and why he refused to look for the cause of his trouble in the organ of accommodation, is a puzzle to me. If he had tested the distant vision with smaller letters than he did, then he would doubtless have found that it is not perfect, but slightly impaired. He deserves credit, however, for the remark that the eye is not painful under such circumstances. The ciliary muscle has non-striated fibres, and has therefore not the “muscle-sensibility” of the striated muscles.

A distinction should be made between monocular and binocular asthenopia. Monocular, or ciliary, asthenopia may be present in both eyes, but cannot be called binocular, and produces no pains, as long as the eyes do not make an effort to co-operate. Any one with normal eyes can produce the pains of binocular asthenopia by over-exerting his binocular vision.

Over forty years ago Oppel, showed that lenses are not an essential part of a stereoscope. He demonstrated, that, to produce a binocular stereoscopic view, all that is necessary to do is to prevent the eyes from seeing both pictures at the same time. This is done by a screen which extends in the median line from the nose to the middle plate on which the pictures are located.

If the pictures are congruent and the distance between their centers the same as the pupillary width of the observer, and both pictures stand vertical, so that all their lines are parallel, then, instead of two small pictures, one large binocular stereoscopic image will be seen. If the pictures are not arranged correctly, if they stand too far apart or too close together, or if their lines are not perfectly parallel, then the eyes will make some efforts at fusion. If the eyes be normal, differences in the pictures will be overcome and a single binocular image will result, but the efforts connected herewith will soon make the healthiest eyes ache and will give the observer the headache which is characteristic of binocular asthenopia. It is a fatigue pain of the extrinsic muscles of the eye. They ache, when they are tired, but the ciliary muscle, however exhausted, cannot ache.

The binocular origin of the pains of asthenopia is the cause of the rapid disappearance of all symptoms of eye-strain after enucleation of one eye. A single eye knows no painful asthenopia, it causes no headaches and produces no eye-strain. Even the refraction is influenced by the removal of the fellow eye. Many writers have called attention to the rarity of a perfectly emmetropic eye, the best chance to find one is in people who had one eye removed when of tender age. The isolation seems to insure the eye not only against eye strain,

but also against the development of astigmatism and myopia. Even a pre-existing hyperopia seems to disappear after the removal of one eye, provided this be done in early youth.

Since Donders' time, asthenopia has been accepted by students of ophthalmology as a consequence of errors of refraction existing before the development of asthenopia, and this opinion has become so well established in the minds of the medical fraternity that it appears as a challenge to doubt its correctness. Only one change has been attempted; Savage and others taught astigmatism to be what the others thought hyperopia was responsible for.

To form an independent and unbiased opinion of the relation between errors of refraction and general health, the writer has tested and recorded the vision and refraction of several thousand people. He has inquired into their general health and watched a large number for years. These records, of school children alone, comprise over 3,000 names, showing in the most convincing way the independence of asthenopia from errors of refraction. Any kind of an error of refraction can exist for years in healthy people without making its presence known by any other symptom, save impaired vision; and this often escapes the attention of the ametropes. If the health fails, from certain chronic affections, which are liable to be overlooked, because they are compatible with the appearance of perfect health, then, people with errors of refraction may suffer and will then readily accept glasses. They will often derive great benefit from them, not only to their eyes, but also to their general health, through relief of the now existing eye-strain.

As a cause of asthenopia auto-intoxication stands first, but it is often difficult to detect, the patient being, as a rule, unaware of its presence. It seems that sometimes substances are absorbed from the bowels, which have a weakening effect on non-striated muscle-fibres. This shows itself in the bowels as chronic constipation, from weakened peristalsis, in the blood vessels as dilatation, which in the veins may lead to varicosities, while in the arteries it lowers the blood pressure. In the eye it will show itself as weakness, as insufficiency of the ciliary muscle, and the low blood pressure may lead to "astigmatism with the rule," according to the principles laid down in the beginning of this paper.

In children, asthenopia is often a sequel of measles, even of scarlet fever. It has no connection with the conjunctivitis, which is one of the typical symptoms of measles. It remains sometimes for years after the conjunctivitis has disappeared, and stays with children who enjoy apparently perfect health. As influenza often causes a long lasting weakness of the heart

with distressing spells of asthma, so measles often produce a merely functional disturbance of the co-operation of the eye muscles, without organic lesions, simply through weakness of a certain nervous center.

A child may have hyperopic astigmatism, but it remains unnoticed until the eyes ache, some time after a mild attack of measles. One would not think of attributing this to the measles. An oculist is consulted who discovers the astigmatism, and the splendid effect of the glasses in relieving the eye strain, confirms the belief that the real cause of the trouble has been found. It is even possible that the astigmatism did not exist before the measles, but was caused by it, through a lowering of muscular tonus.

In people over forty years of age, a rheumatic-gouty diathesis is a very common source of asthenopia. Such people frequently have mild premonitory symptoms of glaucoma, but, nevertheless, they consider themselves and their eyes perfectly healthy. They only want glasses, because their eyes are so easily tired, ache, and "give them a headache." Such people often prove very troublesome patients, especially if they have a hyperopic astigmatism. One looks there for the cause of the trouble, and instead of being put to rest, their eyes are subjected to all kinds of trials to find the axis of the astigmatism, and instead of medical treatment they receive a variety of spectacles.

While measles apparently produces astigmatism in youthful eyes, by lowering the intraocular tension, a rheumatic-gouty diathesis seems to eradicate astigmatism by increasing the intraocular tension. Of all stereometric bodies the ball contains the largest space under the smallest surface; therefore, increased intraocular tension will aim at restoring the ball shape of the eye.

Rheumatic-gouty diathesis will in the same way lead to presbyopia, which is, in reality, nothing but a permanent "asthenopia of the aged." Presbyopia also seems to have a tendency to eradicate hyperopic—never myopic astigmatism. Occasionally elderly people consult me and state the glasses which they received several years ago from a competent oculist, are at present unsatisfactory, and on examination it is found they have cylindrical lenses, but no astigmatism, and they now need spherical lenses. Such people have told me many times their glasses were entirely satisfactory until about six months ago. Therefore, it must be assumed that a change took place in the refraction of their eyes.

Another cause of asthenopia which easily escapes attention of the physician as well as patients, are sexual disorders. The patients may appear perfectly healthy, and yet unconscious

of their trouble, or, if they are aware of it, they may be unwilling to disclose it. The influence of the sexual sphere, of the development and the normal functions of the sexual organs, of private diseases, of secret vices, etc., on the general nutrition of the body, especially on the nervous system, is generally known, and it seems perfectly natural that so complicated an act of innervation, as the balance of the eye muscles, is easily affected by any disturbance of the kind.

The following case will show how difficult it is sometimes to make the correct diagnosis. Five years ago a robust man of about 25 years consulted me for headaches which, he thought, might come from his eyes, because he could not find any other cause. An examination revealed a low-grade hyperopic astigmatism with inclined axis. He received glasses which did him a great deal of good. He said the glasses made him free from his headaches, and, as soon as he took them off, the headaches would return. This we took for conclusive evidence that the cause of the headaches was in his eyes. Several months later he told me the glasses had cured his headaches entirely, and he could do without them; on examination, however, it was found that his astigmatism was unchanged. About a year later he told me his headaches had returned several times, but he had always cured them right away with his glasses. At my request he watched now his health closely, and finally he admitted that several years before his first visit to me he had gonorrhoea, followed by gleet, and every time when he had his headaches, he also noticed a little discharge from the urethra. It appears that even from the urethra substances can be absorbed which, through auto-intoxication, weaken the nervous system, with the effect that an astigmatism which can be tolerated during perfect health, produces headaches and needs temporary correction.

In many cases which are considered as settled, after glasses have been prescribed, a closer investigation would reveal the real cause of the trouble at a place where it is least supposed to be. In a nine-year-old, apparently healthy boy, with hyperopic astigmatism, the cause of the eyestrain was finally discovered in undescended testicles.

One of the most frequent causes of asthenopia is a poorly darkened sleeping-room, especially if the health of the sleeper is weakened through sundry causes, so that the sleep is not profound. It is a well known fact, but not sufficiently appreciated, that during sleep the muscles of the eye ball are not simply in a condition of rest—at the zero point of contraction, perfectly relaxed—but they are in a spasmodic contraction, turning the eye balls in and upwards, in the same position

which they are made to assume when people are hypnotized. The pupils, as long as sleep is not exceptionally profound, are slightly contracted; the condition of the ciliary muscle cannot be ascertained. Judging from the pupil, it is probably also a little contracted. The eyes, during sleep, are in the same way as in daylight, united in synergetic action and the power of fusion is not suspended. Therefore, if, during an insufficiently profound sleep, light from a small object, for instance a crack on the side of a window shade, illuminated by an arc light on the street, strikes the eye, some efforts at fusion will be made and the eyes will be fixed in an abnormal position, especially if the light comes from the side, so that the images on both retinæ are far apart. The consequence is, besides a further disturbance of the sleep, that the patient awakes in the morning with tired and aching eyes.

The surroundings of the eyes during sleep, especially in young children, deserves the greatest attention, as there is the most important source of the development of errors of refraction and strabismus.

Although constantly disproved by all statistics, the opinion is still held that myopia originates in poorly lighted school rooms. Risley, in Norris and Oliver's system, says:

"It is a significant, though discouraging fact, that the increase as found by Cohn, both in the percentage and the degree of myopia had taken place in those schools where he had especially exerted himself to secure the introduction of hygienic reforms, and the same is true of the observations of Just, who had examined the eyes of 1,229 of the pupils in the two high schools of Zittan, in both of which the hygienic conditions were all that could be desired. He found, nevertheless, that the excellent arrangements had not in any degree lessened the percentage of increase in myopia."

Risley felt instinctively the close relation between hyperopic astigmatism and myopia, but he could not free himself from the belief that the former is congenital and the latter is acquired in the school room. Therefore, instead of recognizing both as brother and sister, he mistook the former for the cause of the latter. He says:

"My own cases without exception, passed from the hypermetropic ball over into near-sight, through the turnstile of astigmatism. In all of them, the observed changes of refraction were attended with pain and symptoms of external irritation—e. g., blepharitis, conjunctival hyperaemia, increased lachrymation, undue sensitiveness to light, etc., while the ophthalmoscope revealed advancing pathological changes in the choroid. In no instance did these eyes, in passing from hypermetropia into myopia, become emmetropic at any stage of

their progress. It would seem, therefore, that the inherited congenital anomalies of refraction, particularly astigmatism, are responsible for the myopic eye, by virtue of the pathological changes they occasion in hard-worked eyes, rather than any inherited pre-disposition to disease.

"The small or hypermetropic eye-ball is always present in animals, in infants, in the uncivilized races, and in those who pass their lives in employments of the grosser sort, while myopia is always unknown under these conditions of life."

If Risley had thought of the sleeping room, then his views would probably have taken a different course. The "poorly lighted" school room must be considered, too, and together should be charged not only with causing myopia, but also astigmatism and strabismus.

The words "poorly lighted" do not refer so much to the quantity of light furnished, as to the distribution of the same. In all kinds of rooms with narrow windows far apart, or bright days especially the eyes feel "drawn" and ache, and the eyes of school children in such rooms show many cases of hyperopic astigmatism. If the eyes of the same children are re-examined six months later, after a vacation with outdoor exercise, the astigmatism will be found to have disappeared in some cases, while in others it has become permanent.

It is not that by too small a quantity of light the children were forced to hold the books too close and to over-exert the internal recti, as is generally assumed, but the narrow, bright windows attract and twist the eyes constantly in efforts to fuse images, and by these involuntary exercises, the muscle-balance is disturbed. Some of the muscles become too strong and astigmatism and heterophoria result in young children—even strabismus.

While my records very clearly show that hyperopic astigmatism originates this way, it was never possible to me to trace a case of myopia to the school room alone. Hyperopic astigmatism can be accounted for by a disturbance of the muscular equilibrium alone, and therefore has a chance for recovery. But in myopia there is an atrophy of the sclera, on the posterior pole of the eye, between the disk and the yellow spot. This cannot be repaired.

Atrophy is produced only by a constantly working force, traction or compression, which interferes with the circulation of the blood. The conditions necessary for this are not present in school where the eyes of the children are in constant motion, but they exist during sleep, if the eyes are fixed in a certain position through a cataleptic contraction of the extrinsic muscles.

Risley's description of the development of myopia is not confirmed by my records. They contain the names of dozens of myopic school children who did not realize their condition before they had their eyes tested, and whose eyes never ached and were never inflamed. For instance, W. H., a 14-year-old, very intelligent boy, never thought that one could have a better sight than his, until he noticed the difference at the test in school. His refraction was found at the disk 0, just the emmetropia of Donders. There was no astigmatism. His vision was with both eyes together 20-60, and with each eye alone 20-80. The best vision obtainable was 20-20, which he got with lenses—1.50. His eyes never gave him any trouble. His father and all his brothers and sisters, are hyperopic, only the mother, who is of German descent, is myopic, and he looks very much like her. Also the mother told me that her eyes were never inflamed. She cannot remember the time when her distant vision was better than it is now, and thinks she was born this way.

Schmidt-Rimpler says myopia is rarely congenital. Jaeger claimed that 78 per cent of the new born are myopic, but this was found to be a mistake. Below the age of ten years myopia is rare, in the teens it commences and develops rapidly. Adults seem never to develop myopia, except through keratoconus.

The youngest myope that I have seen, was a little girl of six years. The ophthalmoscope, under thorough mydriasis, showed in the right eye—10.00 D., in the left eye—8.00 D. She is an inmate of an orphans' home, and nothing could be learned about her parentage. The second youngest was a little girl of 7 years, with—3.00 D. in both eyes; she is the daughter of a professional man who is himself very much near-sighted.

My records show the influence of inheritance in many cases.

At Chinook, Mont., in a school house with 85 children, there were 5 myopes, one girl and four boys. The mother of the girl has myopic astigmatism. The boys all come from the same family—four brothers. Their father and mother and other brothers and sisters are not myopic, but the mother told me that she is of German descent, and that several members of her family were near-sighted. The boys live on a ranch, they are not much civilized, and do hardly any reading. They do certainly "pass their lives in employments of the grosser sort." Nevertheless, they developed myopia; the oldest is now 18 years, the youngest 12 years old.

It would be interesting to know on what foundation stands the time-honored idea that savages are exempt from myopia. Even Risley quotes it as an established fact. My limited

experience with Indians is not favorable to it; there are some myopic Indians who never did any reading or writing.

Compared with other nationalities and races, the prevalence of myopia in children of German descent is striking; none of the others, however, are exempt.

My investigation led me to three assumptions concerning the origin of astigmatism and myopia, viz.:

First, both, as a rule, are not congenital, but originate in early youth.

Second, they are binocular in origin, being caused by an abnormal co-operation of the muscles of both eyes.

Third, they originate mostly in night-time, during sleep.

Therefore, the idea suggested itself to me that these two kinds of errors of refraction, if detected early, might be amenable to treatment with a remedy which suspends the co-operation of the eye-muscles and put the ciliary muscles of the eyes at rest during sleep. Such a remedy is homatropine hydrobromate. The instillation of one drop of a solution of one grain to the ounce of water at bed time into each eye, has a splendid effect on eye strain. It operates only during the night and does not disturb the sight in daytime.

Of late it has more and more become customary to fit small children and young ladies of delicate health with spectacles, when their eyes ache from some obscure cause. It is time to protest against this practice. With homatropine the writer has saved dozens of women and children from being fitted with glasses, and has weaned other dozens after they were fitted. Our first and most important duty, however, is always to try and find the primary cause of the trouble. A few weeks of treatment with homatropine is always beneficial, whether it be given together with some treatment of the original cause, or alone, if the cause cannot be found. Glasses should be the last resort only. They may be given for temporary use during illness, and great benefit may be derived from them, (see Ranney, "Eye-strain in Health and Disease").

It must only be borne in mind that the casual connection is not—congenital ametropia, eye-strain, disease, spectacles, cure—but that the disease is always the first link of the chain, and for it we should always search diligently, even after the most successful correction of the error of refraction.

At the sixty-seventh meeting of the British Medical Association in August, 1899, Dr. Adolph Bronner recommended the use of a 1 per cent solution of homatropine at bed-time for the relief of asthenopia in students, instead of the orthodox method of treatment with atropine. The homatropine gave in some cases entire relief, while in others it enabled the patients to tide over the difficulty, until they could give their eyes a thorough rest.

CONTUSIONS OF THE EYE PRODUCING OBLITERATING HYPHEMA.

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ST. JOSEPH, MO.

In employing the term "obliterating" hyphema, I wish to state that it seemed to be the most suitable for the description of the conditions I am about to discuss; for I expect to limit myself to contusions producing hemorrhage sufficiently copious to "obliterate" all view of either the anterior chamber or the fundus. The impossibility of intra-globular inspection, the puzzling surface signs, the sudden and complete loss of sight, the great suffering, the absolute necessity of a conditional prognosis, and the practically uniform measures of treatment until clot-absorption, make the subject well worthy of some attention.

I beg leave to report a few cases illustrating the abstractions at the close of this paper. (Contusions resulting in counter-ruptures either with or without dislocation of the lens under the conjunctiva, have been here excluded, as according to my experience obliterating hyphema is exceptional in these.)

Case I. Mr. E., of Cawood, Mo., aged 35, in good health, but for years past annoyed periodically with trachoma, consulted me on account of an injury to his left eye. While splitting wood, a large piece rebounded and struck him in the left orbit. He experienced a sickening pain nearly causing him to faint. On trial, he found vision completely gone, but excepting a little cutaneous bruising no damage was observable. However, heavy, dull, throbbing pain appeared in his eyeball, increasing steadily, until on the second day a bad brow-ache was added, which gradually extended over that whole side of the head. He complained of moderate photophobia, some lachrimation, and a great deal of scratching of the lids on the ball. Eversion of the latter showed a number of old, crumbling granulations not especially inflamed. The upper lid presented an edematous puffiness and the conjunctiva exhibited moderate, but distinct, chemotic swelling, most marked around the pericorneal border. Focal illumination revealed a steamy haze within the corneal structure, but no loss of substance anywhere. A brownish-red reflex from the aqueous indicated blood, while a deep capillary halo in the sclera around the limbus corneae joined evidence with the

brow-ache as to iritis. Palpation showed eyeball as hard as a marble. Vision was gone, but strong reflected light produced qualitative perception, and an effort at localization elicited some correct answers, though with a great deal of hesitation. Suffering was intense, making sleep impossible. These were the features five days after the injury.

Diagnosis:—Contusion of the eyeball resulting in hemorrhage into the aqueous humor, setting up acute glaucoma and iritis.

Prognosis:—Favorable, if the visible and inferable damage is not aggravated by conditions not now observable.

Treatment:—Measures addressed to—

1. Glaucomatous tension,
2. Iritis,
3. Inflammatory action in general and to the resorption of blood.

1. A cataract knife was pushed into the anterior chamber, parallel to the plane of the iris and about one-eighth inch from the scleral border. This method produces a valve-like wound which will not drain except during depression of the posterior wound-lip. In this manner all fluid (straw-colored) that would flow was allowed to seep away. The ball became immediately soft, and the suffering from the immense "bursting" pressure vanished.

2. Atropia (1 per cent) was instilled and hot compresses were ordered, 30 minutes out of every hour.

3. A purgative ($\text{Hg}^2 \text{Cl}^2$ gr. vj.) was given before bedtime as a revulsive. The night was spent in sound and refreshing sleep, which, since the accident, the enormous suffering had prevented. All active pain was now gone, although great tenderness of the eye-ball remained for three or four days longer.

After two weeks, the sight began to return, owing to the clearing of the aqueous humor. In another week the patient was discharged with "sight practically as good as before." There had, in this instance, been no damage to the lens or the structures beyond, and even the iris reacted well to light and mydriatics. This exemplifies the mildest of the cases under consideration.

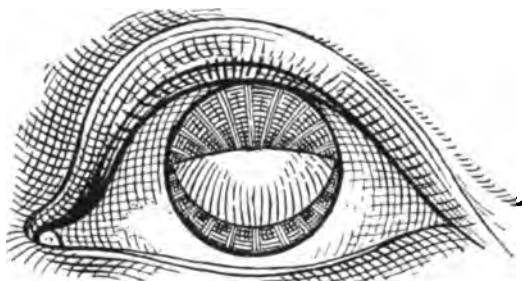
Case II. Mr. S., of Stanberry, Mo., while trying to discipline a cow by means of a whip carrying in place of an ordinary "cracker," a piece of wire bunched up in a knot, was struck in the right eye. He hit the limb of a tree, around which the lash wound itself, increasing in speed and force with the diminution of its length, and striking the patient's eye. He was seized immediately by a most atrocious pain, dizziness and sickness at the stomach. During the night he

became delirious with pain, and had to be held down during his ravings, and all this in spite of a hypodermic of morphin. The delirium left after the first night, but the eye-ache continued unabated. When I first saw him he constantly moaned with his hand placed over the bandage (third day); upper lid puffed up, conjunctiva chemotic, deep pericorneal halo, no loss of substance on cornea, but front epithelium stippled. The whole keratic tissue was hazy and opaque, with a brownish-red reflex from the anterior chamber. Photophobia and laceration moderate, vision abolished, save qualitative light perception on direct sunlight, total inability to localize. Tension of eye very hard.

Diagnosis:—Contusion of eyeball, resulting in hemorrhage into the aqueous humor, and acute glaucoma, with other possible damage not now determinable.

Treatment indications as in first case.

Paracentesis of the cornea eased severe pain at once, although some tenderness continued several days afterward. After three weeks the clot absorbed and the eye in shape illustrated. The lens had been dislocated into the vitre-

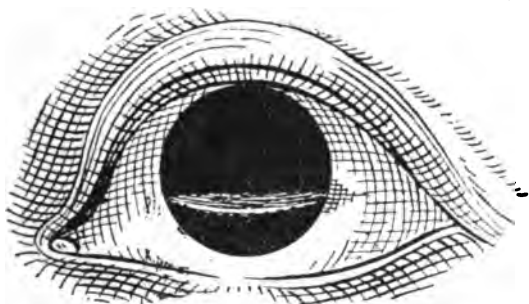


CASE II. After blood absorption.

ous nearly at right angles to its normal position. The lower edge was thrown forward prolapsing some into the anterior chamber, thus forcing the pupil into the shape of a lateral slit. The reactive iris inflammation caused adhesions to the lenticular substance from which no mydriatic would free it. Localization was re-established with strong reflected light, but form vision was impossible. The eye being quiescent, the patient asked to be dismissed, refusing further efforts to clear the pupil. I warned him to return at once in case of trouble (from lenticular swelling). The lens was entirely transparent as far as the projecting portion could be observed. (Case II.)

Case III. Mr. Y., of Alexandria, Neb., sought my advice for an injury to his left eye. While watching a crowd of

young men firing off their revolvers at railroad ties, he suddenly felt something strike his eye. The intense pain caused him to put his hand to the organ, but, as soon as he covered it, a flattened lead bullet fell from the nasal corner of the eye into his hand. His sight was gone at once and the eye watered considerably. He suffered severely for a few hours, then the pain gradually wore off. The next morning, when he arrived at my office his eye seemed easy, while not moving. Upper lid not edematous, no chemotic swelling, no deep pericorneal halo, cornea hazy, with dark brown reflex from the anterior chamber, tone very soft, in the lower third of the corneal circle is seen a curved line of grayish color across the cornea,



CASE III. After injury.

concavity up. The portion of cornea included between it and the pericorneal arc below has the shape of a lunar crescent. At the temporal end, this line springs from a small patch of conjunctival defect, such as one observes after cauterizing with a glowing Paquelin point. The line is widest in the middle of the cornea, and abundantly fringed at the lower edge, which shows that the flattened bullet had produced a terrace cut by repeatedly slipping on the corneal tissue as a dull knife would on a green branch. Owing to the blanching of the bruised wound-lips, their outline was plainly marked off against the dark background. Numerous shreds connected the posterior (inner) margins of the wound-lips. Healing was undisturbed under careful antisepsis, atropin instillations and the pressure bandage.

Case IV. Mr. F., was struck on the eye by a piece of iron from an exploding cannon. Light gone instantly; other symptoms like those of case I, but after the first reaction-pains no hypertonia or suffering. After absorption of the clot: iridodialysis of upper third, the detached iris hanging across the pupil like a wash-line. Lens subluxated by horizontal axis torsion and cataractous; qualitative light perception, but no ability to localize. Lower portion of iris reacts fairly well

to light. From cosmetic consideration the detached iris was excised and the cataract removed. No form-vision resulted.

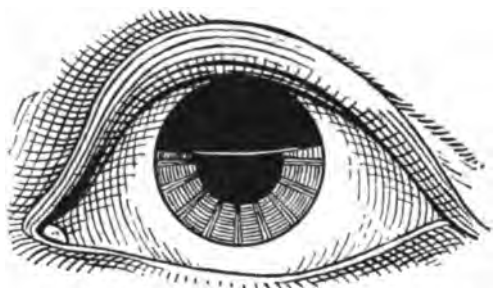
I offer the following deductions:

1. Contusions of the eyeball resulting in obliterating hyphema may, or may not, be complicated with deeper mischief, but uncomplicated cases are in the minority.

2. They are apt to be followed by acute glaucoma, the chief cause of the excruciating and continued suffering.

3. In the absence of septic contamination acute iritis seldom develops.

4. When the contusing force at the same time secures non-infected drainage from the anterior chamber, the immediate reaction, though, perhaps very severe, subsides within



CASE IV. After Absorption.

6-12 hours, glaucomatous tension not being able to appear.

5. The stippling (dissociation) of the anterior epithelium and the parenchymatous haze are due chiefly to the profound shock to the local lymph-system, for the clouding does not disappear with the reduction of the intra-ocular pressure. It often lasts a week or longer.

6. Drawing off the effused blood is neither practicable nor desirable, for the latter clots a few moments after leaving the vessels. During this process the fibrin binds the coagulum closely to the iris, which tends to narrow the pupil (fibrin contraction). On the other hand it shuts off the light and serves as a quasi iris splint, thus helping to ward off iris-teasing. But with all this a practically painless subacute iritis occurs tending to cause synechiae.

7. Atropia should always be instilled, not only with a hope of dilatation, but also on account of its most valuable analgesic effect upon the iris.

8. Glaucomatous tension should be at once relieved by passing a cataract knife into the anterior chamber parallel to the plane of the iris. This makes a valvular wound which can be made to drain at will by depression of posterior wound-lip.

9. For the purpose of antiphlogosis I order:

(a) R. Hydrargyri Chloridi Mitis

Sacchari Albi aa gr. vj.

M. S. Take at once.

This has an excellent revulsive effect.

(b.) Hot compresses as hot as can be borne, for thirty minutes out of every hour. Their wonderful soothing effect is usually not needed after 24 to 48 hours, or at least not at such close intervals.

10. No prognostic promises should be made except to attend to the apparent and evident results of the injury (suffering, blood effusion, inflammation and possible wounds). Predictions should not be attempted until the clot absorption is absolutely complete, for the phantastic and misleading appearances of a disintegrating coagulum are apt to make one feel very sorry over unnecessary failures at prophecy.

11. The commonest deeper complications are: Sub- or full luxation of lens, cataract (consecutive), iridodialysis, synechia, fundus hemorrhage, and detachment of the retina.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

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(QUARTER ENDING DECEMBER 31, 1900.)

Transfixion of the Iris.

Aschheim, Hugo, Vienna, (Arch. of Ophth., September, 1900).

"At the Heidelberg Congress of 1896, Fuchs read a paper on "Transfixion of the Iris." Now a series of cases have been operated upon and we wish to describe again the indications for the operation and results.

The operation is designed to take the place of iridectomy in cases of iris bombe after exclusion of the pupil, and, in the words of Fuchs, is done as follows: "An incision is made through the cornea $\frac{1}{2}$ mm. from its outer margin with a Graefe knife that is not narrow, the handle being so held that the blade lies parallel to the surface of the iris. The knife is then passed through the prominent iris, and a counter-puncture is made near the nasal margin of the cornea. The knife is then pushed in until the entire width of the blade occupies the counter-puncture section, when it is withdrawn."

The histories of five cases of transfixion of the iris in eyes previously operated on for cataract and of eight cases in which the operation was performed in non-aphakial eyes are given.

"The transfixion of the iris was done here in eighteen cases. In all there was a bulging forward of the iris, due to exclusion of the pupil, followed by increased tension; in some of the cases the eye was aphakic. The purpose of transfixion is to restore communication between the anterior and posterior chambers, return the iris to its normal position, and reduce tension. It matters not whether one or more perforations

are made, provided any one of them remains permanently open.

Perforating wounds of the iris do not close if no iritis is set up. This observation led Fuchs to try transfixion, with the results here recorded. In three of these cases the result was not permanent, because irido-cyclitis again broke out. In certain conditions transfixion seems preferable to iridectomy."

The Wedge Operation for Entropion and Trichiasis.

Herbert, H., Bombay, (The Lancet, November 3, 1900).

"Within the space of one and one-half years, some years ago, I operated on 130 upper lids for entropion and trichiasis by Snellen's method, slightly modified, with excellent results. A large majority of the cases requiring it were those of combined entropion and trichiasis, some of them being very bad cases indeed. The ordinary Snellen's operation is insufficient for many of our old neglected cases, and success in these depends entirely on the observance of the details pointed out below. If the necessary rules are followed the operation is equally suited to the mildest and to the most severe cases, to trichiasis as well as to entropion. The ordinary operation consists simply in the removal of a wedge of tarsus with its overlying muscle, the necessary incision having been made through the skin, and the parts are adjusted by Snellen's suturing. The points on which I wish to insist are as follows:

1. A strip of skin two millimetres or more broad should be cut away, at least in all bad cases, unless the skin be contracted and scanty. Otherwise it is redundant afterwards and the upper lip of the wound tends to overhang the lower. It leads to no shortening of the lid beyond that produced by the excision of tarsus.
2. (a) The depth of the tarsal wedge removed should in all cases be sufficient to divide completely the tarsus. If the conjunctiva be penetrated in places no harm results. The whole thickness of the tissue being divided it is found that the conjunctiva and subconjunctival tissue are sufficiently loose or extensible to permit of very considerable displacement as well as rotation of the lower segment of tarsus, which carries with it, of course, the border of the lid.
- (b) The breadth of the wedge at its base depends largely on the degree of entropion existing. When the lower portion of the tarsus is much thickened and bent, the rounded swelling of its anterior surface renders it an easy matter, and indeed almost imperative, to remove a broader wedge than usual. But in some of the older cases of entropion the tarsus is much contracted vertically and the thickening involves the

whole or greater part of it. Care has to be taken in these not to remove too much or the wedge may easily be made to include the greater part of the tarsus.

(c) The position of the wedge is important. The strip taken should be as near the free margin of the lid as possible, i. e., immediately above the roots of the eye lashes. Thus we have quite a narrow strip of tarsus left below and a comparatively broad plate above, so that when the anterior surface of the two are drawn together, any displacement which may occur will be in the lower and not the upper piece. The broad plate above affords a fixed basis from which one can work on the more readily moved and more readily moulded narrow marginal strip, with sutures. 4 1902

3. It is in the suturing that Snellen's operation most distinctly fails to make the most of its opportunities. The sutures should be entered as in Graef's operation. The curved needle is to be introduced a little behind the most posterior lashes, wherever they may be situated, and passed obliquely the lower margin of the skin wound. Thus the more the trichiasis or distichiasis the further back will the point of entry be, and when the sutures are pulled upon the more will the border of the lid be brought forward. The needle should then be passed into the anterior surface of the upper piece of forward and upwards, to be brought out immediately above tarsus distinctly above the cut surface, and brought out again after taking a firm hold; neither skin nor muscle is taken up. Introduced into the tarsus thus the sutures when tightened have distinctly more effect in bringing the eye lashes forward than when introduced "through the upper lid of the tarsal loss of substance." The lower tarsal segment, with the lid border, tends to draw up on the anterior surface of the upper segment. Three such sutures are enough, tied in the ordinary way. It is quite unnecessary to tie them tightly. The parts must be simply retained in position, and not pulled forcibly into position by the sutures. I have not had any sloughing of the lid margin; but it must be very easy to produce it by tying the sutures tightly. The two end-sutures (of the three) require particular care in the tying, as the parts are apt to be held in their original position by the clamp. Two other sutures, passed through the skin only, suffice to bring the edges of the skin wound into close apposition.

One of the main advantages of the operation is its inherent adaptability to the needs of individual cases. Well-developed entropion brings its own remedy in the broader wedge taken, and bad trichiasis or distichiasis insures an application of the sutures which increases the displacement and rotation of the lid border. Its effect is permanent, except in cases where untreated trachoma again leads to cicatricial con-

tractions. The shortening of the lid is slight and of no account in the great majority of cases. In bad cases there is apt to be a depressed line of scar left unless care be taken that the edges of the skin wound are in accurate apposition."

Three Cases in which the Superior Cervical Ganglion of the Sympathetic was Removed, with Remarks Upon the Operation.

Burghard, F. F., London; (Brit. Med. Journ., October 20, 1900.) The writer believes his experience is worth recording, not so much because it throws any light upon the value of the treatment, but "because all the symptoms produced by the removal of the ganglia were carefully watched and they therefore furnish some data upon which to base a knowledge of the immediate and remote physiological effects of the removal of these structures." He sums up the various symptoms produced by removal of the ganglion as follows, grouping them into those that are constant and those that are variable:

The Constant Symptoms Following the Operation.—These in my cases were only three, namely, ptosis, severe pain in the head upon the side operated upon, and congestion of the vessels of the face. To them, no doubt; should be added, in all cases where the nervous mechanism of the eye is unimpaired, contraction of the pupil. It is true that this was not observed in the case of glaucoma, but that, no doubt, was due to the extensive local affection. The ptosis, arising from paralysis of the superior palpebral muscle of Muller, was immediate, marked and lasting in all cases, although it improved a little as the time went on. The headache, although present in all three cases, was variable both in degree and in duration. The contraction of the pupil in the two cases in which it occurred was very marked indeed, and followed the section at once. It was also a symptom that persisted, although the degree of contraction became slightly less as time wore on. It is, of course, much too soon after the operations to hazard any guess as to its permanence.

Congestion of the side of the face occurred in all of the cases, but varied widely in degree. In the first case it was so extreme that there was actual edema of the tissues over the bridge of the nose, and the condition lasted several days. In the third case, on the other hand, it was scarcely marked at all.

The Variable Symptoms Following the Operation.—The remaining symptoms were very variable. Foremost among these was the decrease of intra-ocular tension. This, while decidedly marked in the first case, was only fugitive, and was certainly absent in the other two, or at any rate, so little

marked as to entirely escape notice. Then, as to the question of exophthalmos or the reverse. In only one of the cases is there any note of anything of the kind—and, curiously enough, it was exophthalmos that was observed. In this connection it is interesting to notice that at the discussion upon the subject at the Clinical Society, Mr. Mackay stated that he had seen a case in which exophthalmos had followed an injury to the cervical sympathetic in the operation for the removal of enlarged cervical glands.

Systematic Cleansing of the Nasal Cavities Before Operations Which Involve Opening of Eyeball.

Lippincott, J. A., Pittsburg, Pa., (Journ. Amer. Med. Assn., October 13, 1900). The writer points out the fact that operations which involve opening of the eyeball are occasionally followed by infection and suppuration, even when well-executed, clean, and otherwise most perfect from a mechanical point of view. The measures usually taken to prevent infection which have reference to the field of operation, and to the preparation of the instruments are probably as good as could be adopted.

He is convinced that the principal source of infection in eye operations as now generally performed is to be sought in the nasal chambers, from the intricacies of which large numbers of micro-organisms crowd through the lachrymal passages into the conjunctival sac. Hence we can scarcely expect to wholly eliminate suppuration following operations on the eyeball.

"We may, however—and it would probably be good surgery—carefully examine the nasal cavities in all cases before operating, and, where disease of this is observed or suspected, apply a more or less prolonged preparatory treatment. Indeed, no harm can, and much good may, result from spraying the nostrils with an antiseptic solution before operating in every case. In opposition to the view here expressed, it might be urged that nasal catarrh is a very common affection, while corneal suppuration after operating is rare. The explanation may lie in the facts that nasal catarrh usually exhibits no purulent tendency, that if there are pus germs in the nasal cavities, they need not necessarily reach the eye, and that even if they do, the invaders may be routed by those not yet well understood agencies which fight for the integrity of the tissues."

"The impossibility of sterilizing the conjunctival pouch, demonstrated by Gayet thirteen years ago, is easily accounted for by the free communication through the tear passage with so prolific a breeding-ground as the nasal cavities. Out of 100 gelatin tubes stabbed from the nostrils of adults mak-

ing no complaint of nasal symptoms, 94 contained micro-organisms, among which were bacilli, staphylococci, streptococci, and other forms of micrococci. Such a condition of things was to be expected, from the fact that the nasal spaces are the gateways, and in a certain sense the filters through which passes or should pass all the air we breathe.

"Although I have been for ten years in the habit of giving attention to the nose in cases that appeared suspicious, I did not until comparatively recently commence the method which I now employ and which is as follows: A few hours before operating, in every case, a spray of potassium permanganate 1:2000, is thoroughly applied to the nostrils. In some cases the spraying is repeated immediately before the operation, and, where there is decided evidence of nasal disease, each of the three or four days succeeding it. The permanganate spray, besides not being especially unpleasant, has potency enough to destroy a large portion of the organisms with which it comes in contact, and to lull most of the rest into a beneficial inactivity until the corneal wound is closed. This procedure has been carried out in each of my last 152 operations in which the globe was penetrated. Of these, 60 were cataract extractions, 17 were discissions, 21 were operations for the removal of foreign bodies, and 54 were iridectomies for optical purposes, for glaucoma or for chronic iritis, or were preliminary to the extraction of cataract. In these operations there was not only a complete absence of any kind of suppurative inflammation, but there was an unusual degree of freedom from inflammation or irritation of any kind, although a number of the cases were of an unfavorable nature. The wounds healed with less than the usual degree of redness, and convalescence was more speedy than in my previous experience."

Etiology of Lamellar Cataract.

Bennett, Norman G., London. (The Lancet, November 17, 1900. Report of November Meeting of Ophth. Society of the United Kingdom). Mr. Bennett began by referring to the measurements of lenses taken by Bernard Duband and Treacher Collins, either ophthalmoscopically during life or after removal of the lens, from which it appeared that the diameter of the opaque zone was never larger than that of the lens at birth and that, therefore, either the lesion was occasioned before birth or the part affected was not the most peripheral at the time of its occurrence. He then described the structures of the hypoplastic teeth usually associated with lamellar cataract and detailed the dates of calcification of the two dentitions according to the investigations of Rose, showing what parts of the teeth might be affected by any cause

acting during the first two years of life. Mr. Bennett described minutely the teeth as they existed in 22 cases of lamellar cataract which he had collected. They naturally fell into two classes on the basis of the extent of enamel affected, but in both classes it appeared evident, if the facts were taken in conjunction with the dates of calcification as investigated by Rose, that the affection had its commencement almost immediately after birth. Its period varies considerably in one class of cases and appeared to be about two years in the other larger class. The exact causation had long been a matter of discussion. After referring to the various causes that had been suggested from time to time, Mr. Bennett described a large number of cases of hypoplastic teeth, showing that among those not associated with lamellar cataract the same uniformity of type was not met with, the determining cause of the defect obviously having occurred at a much later date in a large number of cases. From a number of cases with definite histories he showed that this latter type of tooth was frequently, though not always, the result of an exanthematous fever, whereas those more frequent cases of teeth affected soon after birth were often associated with the history of convulsions and general disturbance of health of an indefinite kind. Sometimes the teeth would have two or more horizontal depressions corresponding with a series of definite attacks of illness. The inference was, then, that lamellar cataract was a disease of early infantile life occasioned by some general derangement of health, the most probable being errors of diet and nutrition. In emphasizing this conclusion Mr. Bennett referred to the developmental similarity between lens and enamel, and cited an opinion of Mr. Collins to show that the inferences which he drew were not necessarily inconsistent with those afforded by the measurement of lenses referred to above, but that lamellar cataract might be the result of contraction of the nucleus of the lens some time after birth.

Operations for Secondary Cataracts.

Callan, Peter A., New York, (Journ. Amer. Med. Assn., October 13, 1900). The underlying principle which guides the writer in operating on pupillary membranes is that we should cut and not attempt to tear them. Personally he now limits himself to two methods in operating on all forms of secondary cataracts.

When the pupillary membrane is thin and veil-like, of uniform color, without whitish bands across its surface, he uses Knapp's knife-needle according to the latter's method.

The method employed by him for operating upon tough membranes, he describes as follows: "For the past several years I have used the forceps-scissors of De Wecker, to the

exclusion of all other methods in operating on thick or tough pupillary membranes, where the lens has been removed, either by extraction or absorption. I consider De Wecker's model the best. The forceps-scissor blades should be 13-14 mm. long from point to heel, and not exceed 2 mm. in width when closed, and the greatest thickness 1.75 mm.

In using the forceps-scissors the corneal opening should be selected so as to give free play to the instrument within the eye. With an occluded pupil, make the corneal incision about two millimeters from the limbus; but with a mobile pupil the corneal opening should be opposite the point of maximum dilation, otherwise we are very likely to button-hole the iris. The iris falls forward with the escape of the aqueous and comes in contact with the scissor-blades. In the case of children, it is imperative to work quickly, otherwise the iris sphincter contracts and covers the opening in the membrane, so that it is not possible to insert one of the scissor-blades behind the tissue to be cut. I find Agnew's angular keratome, which is 16 mm. long and 4.5 mm. wide the most satisfactory instrument for making the opening in the cornea and membrane. It is long enough to reach any part of the anterior chamber where we may wish to pierce the obstructing tissues.

The *modus operandi* is as follows: Incise the cornea at any point from 2 to 4 mm. with the keratome; then partially withdraw the instrument, elevate the handle and gently push down the point through the tissue to be cut by the scissors. The opening need not exceed 2 mm. and the keratome should not enter deeply into the vitreous. Having withdrawn the keratome, insert the blades of the forceps-scissors closed; when within the anterior chamber, open scissors and push one blade through the opening in membrane, then cut. If the tissue is tense and on the stretch, one cut is enough, but with a flaccid membrane two are necessary in order to secure a V-shaped aperture. If we have to deal with a small, occluded pupil, simply limiting our incision to pupillary area will not be sufficient; it then becomes necessary to include the iris-sphincter, if not more, in order to secure a satisfactory result. I prefer to cut the iris above, rather than below, for cosmetic effect. In operating on eyes with displaced pupils, due to prolapse or incarceration of iris, it is necessary to make three incisions with the scissors, one on each side, to free the iris from the traction to the corneal cicatrix and a vertical cut through membrane and iris. The lateral incision should be of sufficient length to free the involved part of the iris, and the amount of pupil displacement should guide us as to what length to carry the downward cut."

Immature Cataract and Its Treatment.

De Schweinitz, G. E., Philadelphia, (Journ. Amer. Med. Assn., December 8, 1900). For the sake of convenience the writer divides lenticular opacities into three classes: 1. Non-progressive cortical opacities. 2. Progressive cortical opacities. 3. Nuclear and mixed opacities. He discusses the etiology of these various forms and determines which cases are suited for treatment directed against disease of the eye itself, for constitutional treatment, optical therapeutics, or operative interference. His conclusions are as follows:

"1. Certain lenticular opacities, most often situated in the naso-inferior quadrant of the lens, occasionally are practically stationary and may be designated "non-progressive." They do not handicap the patient's ocular abilities, and may with propriety be separated from the class to which the name incipient cataract is ordinarily given.

2. Certain lenticular opacities undoubtedly depend, as Rissley and others have shown, on what may be designated "disturbances of the choroid," as apart from active and actual choroiditis; and their progress is sometimes apparently checked by measures—optical, local and general medicinal—which restore the choroid coat to normality. Such measures do not, however, remove from the lens the opacities which have already formed when the patient comes under treatment.

3. Certain lenticular opacities which appear in association with diabetes mellitus, nephritis, lithemia and arteriosclerosis, particularly the last two diseases, are sometimes apparently retarded, like those in No. 2, by measures which are suited to the patient's general condition in connection with local and optical therapeutics; but these measures never dissipate the lens-lesions already present.

4. Certain lenticular opacities produce not only prodromal myopia, but very high degrees of astigmatism, the correction of which may result temporarily in a surprising improvement in visual acuity.

5. Certain lenticular opacities cause an obscuration of vision that may be largely dissipated temporarily by providing the patient with glasses moderately tinted, which give the best visual acuity during mydriasis with a mild mydriatic. Sometimes, under these circumstances, the mydriasis seems to hasten maturation; this fact should be explained to the patient.

6. Certain lenticular opacities, especially in the form of striae of refraction, cause an obscuration of vision which is somewhat relieved by maintaining a mild myosis with weak solutions of one of the myotics.

7. If the vision of eyes suffering from incipient cataract of the nuclear type is improved by mydriasis, this is not a

sufficient indication for optical iridectomy, unless the patient finds by observation that the increased visual acuity, as noted by test-type examination, is also advantageous in pursuing his ordinary occupation.

8. The extraction of unripe cataracts is preferable to any of the ordinary operations for ripening cataract.

9. There is no evidence that electricity has the slightest influence in checking the rate of progress of incipient cataracts, or in dissipating the opacities which have formed.

10. If there is any evidence that massage of the eyeball favorably modifies the rate of development of cataract it is still very insufficient; there is some evidence to show that massage sometimes hastens the opacification of the lens. The subject demands further investigation.

11. There are no "specific remedies" for the treatment of cataract, and there is no reliable evidence that drugs exist which cause the absorption of partially or fully formed cataracts.

12. All lenticular opacities, unless, perhaps, those which belong to the so-called non-progressive group, should be regarded as indications for a thorough investigation of the patient from the general as well as the ocular standpoint, and for an employment of remedial agents—optical, local, medicinal—according to the findings."

Tuberculosis of the Eye: Its Differential Diagnosis, Pathology and Treatment.

Bull, Charles Stedman, New York, (Medical Record, Dec. 8, 1900). The writer contributes an able paper upon the subject of tuberculosis of all parts of the eye, which represents a valuable resume of our present knowledge of this rather rare disorder. The article does not admit of a creditable abstract, and is too lengthy to give in full in this department. In speaking of tuberculosis of the iris, he says:

"Tuberculous disease of the iris occurs most frequently between the ages of five and twenty-five years. It may be either primary or secondary, the latter being the more frequent. Primary tuberculosis of the iris may be unilateral or bilateral. Haab recognizes two forms: one of rare occurrence and ending generally in a spontaneous cure; a second, much more common, ending in perforation and phthisis bulbi. The symptoms of either serous or plastic iritis are generally present. The diffuse form spreads rapidly, and generally invades the entire eye, and the cornea necroses and becomes perforated. This form usually occurs in patients predisposed by hereditary tendencies to the disease. The first or attenuated variety of the disease may recede and disappear without causing general infection. These cases of

attenuated tuberculosis, in which the growths become absorbed and the eye partially regains its functions, are rare. The nodules are very small and scattered, are yellowish-gray in color, with a slight reddish tint due to the blood vessels, and may involve the peripheral border or occupy the angle of the anterior chamber. Their course is very slow, with periods of amelioration and aggravation, and the case ends in a total disappearance of the nodules. Tuberculosis of the iris occurs usually in children as small gray-red nodules at the ciliary margin of the iris, which look like miliary growths. The successive development of new nodules leads to plastic iritis and cyclitis, and then to a general shrinking.

The solitary tubercle of the iris, or so-called granuloma, begins as a small gray nodule, which slowly increases in size, fills the anterior chamber, perforates the cornea, and presents as a large granulation mass, and the eye is lost by general phthisis bulbi. The granulation mass always contains giant cells, and almost always bacilli. At first tubercles of the iris are composed of masses of small epithelioid cells, disposed concentrically round an obliterated vessel, and of a varying number of giant cells. After softening has begun, histology does not help much towards a diagnosis. If a case of tuberculosis of the iris is accompanied by blood in the anterior chamber, the disease has probably invaded the ciliary body, as hemorrhage from this quarter has been known to be the first symptom of tuberculous infection here.

Tuberculosis of the iris has been produced by inoculation of the anterior chamber in animals. Within three weeks of the inoculation the iris becomes inflamed, with the eruption of small, grayish nodules, which grow larger, coalesce, fill the anterior chamber, infiltrate the cornea, and cause perforation. The animals succumb later to a general tuberculosis. The intra-ocular tension is first increased, but later, as cyclitis develops, the tension falls below the normal standard.

Tuberculous growths in the iris may be confounded with gumma, sarcoma, and lepra. They may be distinguished from gummata by their color, their predilection for involving the inferior half of the iris, and by the presence of granular enlargements and the usual signs of pulmonary tuberculosis. A tuberculous nodule may in its early stages be confounded with sarcoma, but the latter is almost certain to be solitary, is rarely accompanied by any iritis, seldom occurs before middle life, and is usually more vascular than a tuberculous nodule. In general, it may be stated that the lesion is probably tuberculous when the growths are multiple, non-vascular, and gray, and are accompanied by granular enlargements. Iritis in a child is generally tuberculous and always serious.

The prognosis in cases of tuberculosis of the iris is always unfavorable; for none of the symptoms enable us to predicate the attenuated form of the disease.

Until we have had a larger experience, and have become more familiar with the nature and effects of tuberculin T. R. as an antitoxic agent, our only advice is to recommend enucleation. It is possible that iridectomy may be useful in the case of solitary tubercle before softening has begun, and will leave the patient with a varying amount of useful vision, but in all cases of multiple growths the eye should be removed."

Blindness from Bullet Wound of the Orbit.

Nettleship, Edward, London, (Brit. Med. Journ., October 27, 1900. Report of October meeting, Ophth. Society of the United Kingdom.)—"Mr. Nettleship gave details of six cases in which the sight of one or sometimes of both eyes was lost or impaired by the passage of a bullet through the orbit without wounding the eyeball. These had been written of as "indirect gunshot injuries of the eye," in which the passage of a bullet through some part of the orbit was followed immediately by free bleeding into the vitreous, and, as this cleared up, by various and mixed appearances of choroidal rupture, choroido-retinal exudation, and changes of the disc without shrinking of the eyeball or any sign that the globe had been ruptured. The question as to how these injuries were produced was answered by the description of a case in which the eye was excised by Cohn, and examined by Waldeyer in 1871. Cohn concluded that a contusion which directly affected only the outer surface of the sclerotic might set up severe and extensive plastic inflammation in the sub-jacent retina and vitreous. Mr. Nettleship mentioned other cases by Cohn, as well as one shown before the society last year by Mr. F. Menteith Ogilvie. He then described his case in detail. The feature of interest in them was the extensive damage of the choroid and retina without wound of the eyeball. These direct injuries were to be explained by the force of the projectile being changed into radiating vibrations of the tissue particles, which as Professor Stevenson of Netley said, "act as secondary missiles." These, passing through the dense sclerotic without damaging it, seriously injured the less resisting choroid and retina whilst dragging on the muscular insertions by the bullet, might also contribute towards the injury. Mr. Nettleship mentioned some interesting experiments by Cohn and Stevenson, which had also been verified by himself, in which they had fired bullets at cylindrical metal vessels, some containing air only, and others water, in both cases with no lid on the top. He showed

photographs and actual cylinders from his own experiments. In the former cases the bullet went through without producing much effect on the surrounding parts, but in the latter, in which the cylinder contained water, the vibrations set up in the fluid had produced very marked changes around the holes made by the bullets. In this way the spinal cord might be injured by vibrations passing through the bone without fracturing the latter. He then compared the results of bullet wounds with those of opticociliary neurotomy, and also with the experimental evidence produced by Poncet, who in healthy rabbits cut the optic nerves, and the posterior ciliary nerves. This latter caused from the eighth day onwards, degeneration of the nerve elements of the retina, with increase of its fibrous structures, marked papillitis, and some inflammation on the outer surface of the vitreous, later on the choroid, near the disc, became atrophied, and finally the degenerated retina became pigmented. In all these cases there was a great tendency for the retina and choroid to become united by inflammation, and this explained the slight tendency there was to detachment. In most of the gunshot cases other cranial nerves were involved, and the commonest paralytic sign was ptosis."

Amaurotic Family Idiocy.

Mohr, Michael, Budapest, (*Arch. of Ophth.*, November, 1900). The writer gives a resume of the papers already published on this subject. He mentions the symptoms and states the pathological changes which have been reported; to these are added a corrected version of the translator's (Holden) views. The history of the writer's case (the forty-second) is given, together with the results of the autopsy, and a description of the brain and retina. He arrives at the following conclusions as a result of his own case, and a consideration of the literature:

"1. Amaurotic family idiocy is a well-defined, independent disease.

2. Chief symptoms: the infant is born normal and develops for some months without any physical or mental disturbance; then it loses strength; the back and the extremities become weak; paralysis appears, sometimes spastic, sometimes flaccid; the reflexes may be normal, diminished or increased. Vision is lost; in both eyes the typical white patch appears at the macula, with the cherry-red spot in its centre on which the diagnosis rests. Later the disc becomes atrophic. The strength continues to fail and the infant usually dies before the end of the second year of life. Usually several members of a family are attacked.

3. Anatomical changes: a great destruction of fibres in the brain, medulla, and cord, particularly in the pyramidal

tracts. An absence or rudimentary presence of the pyramidal cells, at some points fatty degeneration, hypertrophy of the neuroglia.

In the eye: Edema of the macula lutea, increase in the ganglion-cell layer, atrophy of the optic nerve."

Keratitis Petrificans, the Correct Terminology for Ribband-like Keratitis.

Suker, Geo. F., Toledo, O., (Ophthalmic Record, November, 1900). The writer makes a distinction between calcareous corneal deposits and true ribband-like keratitis. He objects to the latter name when applied to the former condition, because the term does not convey to the mind of the reader any positive knowledge of the true pathological condition present in the cornea. Furthermore, it does not determine whether the calcareous condition is a primary or secondary process, nor is it distinctive of the gross pathological appearance of the cornea, since the calcareous deposits often appear in isolated spots instead of in a continuous band. He finds an analogy between the calcareous deposits in the cornea and the "conjunctivitis petrificans" of Leber.

Regarding the etiology of keratitis petrificans, the author says that it is always secondary to some previous inflammation of the cornea; and he believes arterio-sclerosis to enter largely into the etiological factor. He considers the calcareous deposit as a retrograde metamorphosis (in both cornea and conjunctiva): "(1) Of corneal cicatrices or opacities. (2) Of degenerative changes in inflammatory deposits in the corneal interstices. (3) Of a long standing pannus thoroughly vascularizing the cornea. (4) Of a cornea abused by nitrate of silver. (5) Of the results of injuries. (6) In the sequelae of irido-cyclitis and deep keratitides.

The disposition of lime occurs, as a rule, between Bowman's layer and the external limiting epithelial membrane of the cornea, rarely between Bowman's and Descemet's layer. It may appear in small dots, and these may coalesce, forming the lime plaque. With a sharp-pointed spud a grating may be felt, and the cornea in this given area is anesthetic. No one particular section of the cornea seems to be an area of predilection, since the deposits may occur in the periphery or centre.

Generally, these lime plaques do not cause any irritation in the cornea; but when they appear above the surface, the movement of the lids causes considerable irritation. In such cases, the writer recommends scraping until the level of the surrounding cornea is reached. This he considers the only indication for surgical interference with the plaques, though their presence does not in the least interfere with other opera-

tions that may be indicated, causing neither delay nor unfavorable progress in healing.

Hemorrhagic Glaucoma.

Oliver, Charles A., Philadelphia, (Journ. Amer. Med. Assn., December 8, 1900). The writer's paper gives a general survey of this disease. After speaking of the frequency, symptoms and pathology, he adds the following in regard to treatment:

"General therapy must be employed in every case, though unfortunately, by the time the case is met with by the ophthalmologist, it is almost invariably in the stage or condition which requires immediate radical interference. In every case, however, the vascular system must be closely watched and constantly cared for. Sleep, betterment of surroundings, dietetic and emunctorial hygiene in combination with the treatment of any dyscrasia, particularly gout and rheumatism, as shown by Richey, and not infrequently syphilis, constitute some of the main therapeutic means in our possession. Specifically, salicylate of sodium, in large and frequently repeated doses, has, as previously demonstrated by Friedenwald, served the greatest good in two cases that were temporarily relieved by me for quite long periods of time.

Locally, I have never ventured with paracentesis of the cornea, believing that the transient relief gained at best was overbalanced by the danger of vessel-rupture from a too rapidly produced lower support of vascular structure. With anterior scleral puncture, I have not had any experience, nor do I wish to essay it in this type of cases. Sclerotomy I have both tried and seen tried, though in my experience it alone has not been productive of the least permanency in beneficial result. The duration of value of iridectomy followed by equatorial sclerotomy, as proposed by Randolph, I have not yet had an opportunity to adequately study; neither have I seen any case in which Ball's suggestion of removal of the cervical sympathetic after unsuccessful iridectomy in inflammatory glaucoma, might be tried. Galezowski's crucial sclerotomy, and Spencer and Watson's scleral trephining, I have not as yet made any acquaintance with; while sympathectomy without the application of leeches to the corresponding temple, combined with the internal administration of ergot and sulphate of quinine as championed by Abadie, I have never employed. Stretching of the external nasal nerves and electricity cannot, even hypothetically, be considered of any real use in this type of cases. In regard to excision of the related superior cervical ganglion of the sympathetic, I agree with Ball that the procedure is of more value in simple glaucoma than it is in the inflammatory type. The value of the production of thin,

breakable cystoid cicatrices or the use of the formation of permanent fistulous openings is uncertain, as they seem to me to only serve to expose an already disabled organ to microbic invasion with probable septic inflammation.

In my hands, I have had the best permanent results with slowly-performed iridectomies, made after the patient had been properly placed under the full influence of a general anesthetic. The cases chosen were those with apparently healthy irides. As far as possible, the patient was carefully prepared. The operation was done on the bed in which the patient was to lie. The head of the bed was placed on a higher level than the foot, thus raising the patient's head higher than his feet, and reducing the chances of any increased blood-pressure while he rested. The instrument used was a properly sharpened bent keratome. The corneal incision was set far back. The knife was slowly entered, and as slowly withdrawn, allowing the aqueous humor to dribble away along the sides of the instrument. A firm double figure-of-eight pressure bandage was applied for the first twenty-four hours. The best of hygienic and constitutional measures were vigorously sought for and strenuously maintained.

As a result, three out of eight cases—37.5 per cent, a much higher percentage than in any other statistics with which I am acquainted—have been saved for periods of eight, six and four years, respectively, with almost, if not quite normal vision, in fairly large and well-shaped fields that have remained intact to the present time, an almost unprecedented result in this so universally considered hopeless disease. Two other eyes, cared for in a similar manner, were kept in abeyance for quite long periods of time without adequate working vision—the usual result of so-called successful cases. Unfortunately, both of them, after several months' intervals were ruined by fresh intraocular hemorrhages that were produced from slight local traumatism and undue general violence.

During any of the operative procedures that I have tried in this type of cases, I have never had the misfortune to have a hemorrhage appear, although I have seen it take place in three instances.

Two cases of hemorrhage into the interior of the fellow eye previously operated on—one with four days' and the other with two days' interval—I have seen followed by a permanently successful iridectomy on the second eye, the eye primarily operated on requiring removal. In three instances in which miotics seemed to be of some temporary value in mechanically opening the filtration angle, the drugs eserine and physostigmine were usefully continued for some time, though they did not seem to act as well as they do in some of the other types of the disease.

If these measures fail—as they most generally will—however, recourse must be had to immediate removal of the globe.

As can be now well understood, prognosis is almost invariably fatal, although when the local conditions have been gotten into abeyance, the general health kept constantly guarded, and the organ has resumed its functionary powers, relapses may, with a reasonable degree of certainty, not be feared, as, for example, in the 37.5 per cent of cases in my own series—three out of eight. No rule, however, can be laid down. From the sweeping, broad statement made by some, that all such eyes are irremediably lost, to the most sanguine views of those who, by improperly including every doubtful case in their series, have obtained data that are both uncertain and misleading, there is a middle ground that must always be occupied by the conservative, yet fearless practitioner. The state of the patient's health, the condition of the eye, the gravity and the duration of the attacks, and the frequency of recurrence, all enter so persistently into the question of prognosis, that the answer for the value of the best applied local and most judicious general therapy in each individual case becomes in large measure idiocratic in character."

Hemorrhagic Glaucoma.

Posey, William C., Philadelphia, (Journ. Amer. Med. Assn., December 8, 1900). Hemorrhagic glaucoma is defined by the author as an ocular affection characterized by an increase in the intra-ocular tension, as the result of a previous hemorrhagic retinitis. Although now generally recognized as a distinct type of glaucoma, the pathology of hemorrhagic glaucoma is still obscure, so that the microscopical examination of each case is of value. Having carefully studied a case of this kind both clinically and pathologically, the author gives a detailed description of the history and microscopical examination of the case, and adds the following remarks:

"While there is still far from unanimity among pathologists regarding the changes which occur in the ocular tissues in hemorrhagic glaucoma, the majority of observers agree that the most constant lesions are found in the blood-vessels, and more especially those of the retina and optic nerve. Undoubtedly this view largely resulted from the thesis of De Bourgon, which showed, in a comprehensive review of the literature, that these tissues were the most frequently affected in the cases hitherto reported. Thus, of 13 complete pathological examinations which had been made, all exhibited vascular lesions in the retina, such as miliary aneurysms, hyaline and amyloid degeneration, and periarteritis and sclerosis. In 7 of these cases there were lesions in the vascular system of

the choroid also. As a result of this initial general vascular disturbance it appears that a diminution in the circulation of the blood follows that favors the occurrence of hemorrhages, which are rather the result of diapedesis than of rupture of the vessel walls.

As De Bourgon has pointed out, a vicious circle is thus inaugurated; the diminution in the circulation giving rise to the hemorrhages, and the hemorrhages, in their turn, in conjunction with a fibrous transformation of the retina which occurs in the majority of the cases, contribute still further to the stasis of the blood-current. As a result of this, the hemorrhages increase in number, become more extended, and the circulation is finally so impeded that venous thrombosis ensues, in association with a dilatation of the capillaries. Serous exudation then takes place, the intraocular pressure increases and the glaucomatous attack is precipitated.''

Acute Glaucoma after the use of Cocaine, with Remarks on the Use of Holocain in Glaucoma.

Hinshelwood, James, Glasgow, (*Ophthalmic Review*, November, 1900). Opinions differing in regard to the advisability of using cocaine in glaucoma, the report of this case is of interest. Hinshelwood instilled a few drops of a two per cent solution of cocaine into the eyes of a woman of fifty, who had 6 D. Hy., in order to obtain mydriasis for ophthalmoscopic examination. The fundus was found to be normal and proper glasses were prescribed. Shortly after returning home, the patient complained of pain in her right eye, which became more intense, and was accompanied by vomiting. When seen by the writer, the following morning, she presented a typical picture of an acute attack of glaucoma, which he attributed, without any doubt, to the dilatation of the pupil produced by the cocaine. After the use of eserine and internal medication, the pain and tension diminished; an iridectomy performed on the third day resulted in permanent relief from all the symptoms. Normal acuteness of vision was not, however, regained.

In consequence of this experience, the author is more firmly convinced than ever that cocaine should not be used in any eye in which there is the slightest suspicion of glaucoma, and never in the treatment of this disease.

Since holocain has all the pain-relieving qualities of cocaine without its dangerous effects, the writer recommends its use in acute glaucoma whenever it may be advisable to postpone operation until the pupil has become somewhat contracted. Under such circumstances, he considered holocain of great service in relieving pain and in increasing the rapidity of action of the eserine. He has found also that the preliminary

instillation of a drop of one per cent solution of holocain increases the rapidity and intensifies the mydriatic action of euphthalmin. His practice is not to combine the drugs, but to instil the holocain first and follow it in a few minutes by the euphthalmin or eserine. This also prevented the unpleasant dragging sensation which is so often complained of after the instillation of eserine.

"In cases of secondary glaucoma, such, for example, as arise from a rapidly swelling lens after injury, when there is great pain with elevation of tension, great relief can be given to the patient by the instillation of holocain without the danger of further elevating the tension, until measures can be taken for the extraction of the lens. I have used it with great success in a large number of cases of this class. In short, for the relief of pain, accompanied by elevation of tension, holocain is pre-eminently the drug, for not only is there no risk of further increasing the tension, but its anesthetic effects are decidedly greater than those of cocaine."

The Etiology of Phlyctenular Affections of the Eye.

Stephenson, Sydney, London, (Medical Press, October 10, 1900). In the writer's experience from 20 to 25 per cent of the patients who seek relief in the ophthalmic department of a children's hospital do so on account of phlyctenular affections of the eye. There is, however, no general agreement with regard to the etiology of the cases; the purpose of the present paper is to bring into relief the more important etiological points which have been noted in the course of practical work in the out-patient room.

"Nearly two decades have elapsed since Professor Horner (of Zurich) suggested that phlyctenulae were to be regarded merely as an ocular manifestation of eczema. That theory has now received recognition in some of the more advanced text-books. But anything approaching unanimity of opinion as to its truth or the reverse is still lacking.

"For some little time I have noted upon my hospital letters the co-existence of eczematous inflammations of the skin with phlyctenulae of the conjunctiva or cornea. It is clear that three simple contingencies must be considered in this connection:—(1) Eczematous trouble may be actually present at the moment of examination; (2) a history may be obtained of its former existence; (3) it may make its appearance later. I do not pretend that the figures to be quoted are in any sense complete. In the limited time at one's disposal in the out-patient room a scrutiny of the entire surface of any patient's body—such as would be necessary to exclude small eczematous patches on the trunk or extremities—is hardly practicable. Hospital histories are not altogether trust-

worthy; and it is often out of the question to follow up patients for any length of time. For these and other reasons my figures tend to understate the frequency of a present, a past, or a future eczematous inflammation.

"Before entering into details, two axioms must be granted: first, that phlyctenulae are essentially the same things, whether they happen to be upon the conjunctiva or the cornea; secondly, that ulcerative blepharitis is merely an eczema affecting the edges of the eyelids. Lastly, it should be stated that no attempt will be made in the figures to differentiate between catarrhal, pustular, and seborrhoeic types of dermatitis. For present purposes the generic term "eczema" will be held to include the entire group.

"My figures have been drawn from an examination of patients at three different places—namely, the Northeastern Hospital for Children, the Evelina Hospital, and the Ophthalmic School at Hanwell."

The figures at each of these institutions are given and are finally summarized, as follows:

Total number of cases.....	669
No evidence of eczema.....	314 (46.93 per cent.)
Eczema present on examination, once present, or known to have appeared later.....	355 (53.06 " "

"If the hospital figures had been collected with the same care as those at the Ophthalmic School, there can be little doubt that the proportion with co-existing eczema would be far higher than 53.06 per cent. But as matters stand the statistics clearly show that eczema is often associated with phlyctenular disease in one and the same patient.

"Assuming that eczema of the skin and phlyctenular ophthalmia may be traced to a common origin, one might logically expect to find analogous affections of other mucous membranes. Such is actually the case. I have demonstrated lesions in the mucous lining of the cavity of the nose and the mouth, and the external auditory meatus. As regards the nasal changes, I claim no priority, inasmuch as their existence has been mentioned by several authors. For example, Dr. Max Knies of Freiburg, makes the definite statement the "eczematous disease of the nasal mucous membrane is the starting point in three-fourths of the cases of eczema of the eyes and face, or is present at the same time." So far as I know, however, the oral changes have hitherto entirely escaped description.

"The nasal lesions are generally seen (when secretions and scabs have been removed) as shallow ulcers or excoriations lying well within the orifice of the nostrils. I have, however,

met with an earlier vesicular stage. The corresponding alar nasi is often stiff, hot, and rather tender. The eruption is generally associated with a discharge of fluid or matter from the nostril, and the disease is liable to spread from the nostril on to the skin of adjacent parts, thus making the source of original infection. The most characteristic instances of the so-called 'strumous lip' occur in children with eczema of the nostrils, so that it is hard to resist the conclusion that the two conditions are closely connected.

"The oral lesions, in my experience, affect the mucous membrane of the lips, the tongue, or the palate. At an early stage there is a tender, hyperemic area, and this is soon followed by an eruption of vesicles, some of which may attain quite a large size. The vesicles speedily rupture, discharge their contained serum, and leave red, raw, exposed spots. The latter may quickly heal, or become covered with a greyish deposit, so as to conform to the description given in the books of "aphthous stomatitis." Now and then a faint cicatrix remains to mark the site of the eruption. On the tongue the ulcers are usually small, and specially affect the tip. On the palate I have not yet seen an actual vesicle, although such doubtless occur; and it is noteworthy that the dull red erythematous palatal lesions tend to be larger than those met with on the lips. The oral lesions soon heal, but are prone to recur.

"It will be conceded that the existence of changes in the mouth and nose and ear strengthen the view according to which phlyctenular disease is thought to be neither more nor less than eczema of the conjunctiva. In practice, at all events, the theory will be found to work out all round, which would hardly be the case if it were unsound."

"Aside from the question of eczema, it is, of course, known to all clinical observers that phlyctenulae go hand in hand with the tuberculous diathesis. This is exemplified in some of the names bestowed upon the disease by the older writers, such as "strumous" or "scrofulous" ophthalmia or "lymphatic" conjunctivitis. The figures that I have collected upon this point come out as follows:—Family history or personal evidences of tubercle were obtained in 167 of the Northeastern cases, in 37 of the Evelina cases, and in 10 of the Ophthalmic School cases. That is to say, among the total number (669) of patients, tubercle or a tendency to tubercle existed in 214, or 31.98 per cent. The commonest tuberculous manifestations were swelling of, or abscesses, in the glands of the neck, below the jaw, or elsewhere; affections of joint, spine or bone; otorrhoea, with or without mastoid disease; scrofuloderma, phthisis, and dactylitis. I cannot doubt that

a more rigid inquiry into the family history would show that phthisis is far oftener present than is generally suspected in these cases."

Quantitative Color Tests.

Grossman, Karl, Liverpool, (Brit. Med. Journ., December 22, 1900). More than ten years ago I pointed out the shortcomings of the method of testing the color sense by means of Holmgren's wools. At the Tenth International Medical Congress at Berlin in August, 1890, I described the model of an apparatus constructed for the purpose of obviating those defects. The apparatus itself was constructed soon after, and proved to be of service. A long spell of illness and other causes subsequently prevented me from pursuing the subject, but on resuming it I find the matter stands practically to-day where it stood ten years ago.

The insufficiency of Holmgren's test in a number of cases had already been observed by others before 1890. To mention a minor objection to the test; as used at present everywhere it is only a daylight test. With the variability of the quality of the light on the one hand, and the restriction of its applicability, on the other, owing to the frequency of dark days in this country a great inconvenience exists. True, a remedy could be found by selecting a set of colors adapted for a particular artificial light. But the very fact that this has not been done shows how very deep the faith in the infallibility of the Holmgren test is rooted.

Central Color Scotoma.—There is, however, a very serious objection to the Holmgren test which cannot be overcome by any makeshift or adaptation, but claims our full attention, and that is the occurrence of a central color scotoma. This is all the more important and dangerous as it need not be a congenital defect, but may be acquired and even transient—for example, in nicotine poisoning. Here past statistics leave us completely in the dark and are totally valueless. Sometimes it occurs that the faulty mode of examination (Holmgren) declares such an individual color sound, and that practical life then puts him to a more severe test, showing him to be color blind for his actual requirements. I will not take any of the older observations of others or myself, but refer to a case published recently by Mr. Bickerton: The second officer of a 4,000-ton steamer, when on the bridge, could not distinguish between a green and a white light, and nearly brought about a collision with a sailing vessel, a catastrophe being averted only by the accidental arrival of the captain on deck. Mr. Bickerton relates the case without any comment as to its nature. Professor Lodge, to whom he sent the patient for examination, found only "a slight de-

fect of red sensation," and no explanation is given. Without knowing anything further about the case, it would be surprising indeed to me if this was not a case of central color scotoma which would have been readily detected by a proper test. The letter by Dr. Hubert Seager, quoted in that article, says:

I do not remember to have yet seen any discussion on the peculiar form of color blindness to which I myself (and, no doubt, other people as well) am subject—inability to distinguish at night between a red and a green light at a distance exceeding half a mile, though I can pass any test for color or long sight in daytime, and can distinguish colored lamps perfectly at night within half a mile's distance. I tested this condition of my eyesight again last year when I was at sea for a week or two, and found it unaltered. Naturally such a state of color blindness might lead to very serious accidents at night, and the Board of Trade tests should be adapted to such defects.

Clearly here we have a case of a central color scotoma in both eyes. A colored signal sufficiently near is both strong enough and large enough to give a sufficiently large image on the retina, in fact, to exceed the area of the scotoma; if the distance increases both the intensity and the size of the light decrease, and the image falls within the limits of the scotoma, with the result of not being recognized correctly. On the other hand, the Holmgren wool skeins will be easily recognized in such a case. They can be manipulated, and, even if the scotoma be fairly large, can be brought near enough to the eye to cover a large area of the vision field. And that is exactly what we do see in some cases of "doubtful" color blindness.

In order to detect cases of color blindness of the kind just referred to, the following points have to be taken into consideration. The test object must be:

(a) Variable in color, that is, a variety of colors, must be at hand, so as to avoid the learning by heart of three, or four, or five colors only. (b) Variable in size, that is, from a large size down to a very small point. (c) Variable in intensity, that is, it must be possible to make it bright, and through all transitions dark to almost extinction.

This can best be effected by using actual signal lights suitably arranged. An equality of the source of light can easily be obtained as well, a point of great value for the comparison of the results. Moreover, the examinee is thereby put under precisely the same conditions as he meet in his occupation as seaman or railway employee. If the conditions under (b) and (c) are sufficiently variable, there is no need to vary the distance within which the tests have to be recognized.

One other point should be observed. Any method in which the examinee has to give an answer to such a question as, "What color is this?" ought to be avoided. In this respect the principle of matching one color with a second one, to be selected out of a batch of others, which underlies the Holmgren-Seebeck test, is paramount.

Uniformity of the source of light being necessary, the examination is carried out in a darkened room, artificial light of a given kind being employed.

Description of the Instrument.—The following is a description of the instrument I have used. A few modifications which will materially reduce the cost of production, and will also be found to be improvements, will be mentioned at the end.

In order to reproduce in the apparatus the actual conditions of practical life, I took as the source of light an ordinary hand lamp, such as used on some railways. In front of the bull's eye are placed two metal discs, capable of being moved round their centres, and perforated near their edges by circular apertures filled with glasses of various colors. The colors in each of the discs correspond, though arranged in different order. On the other side of the discs is a metal plate, which overlaps them, and is perforated by two holes, one beside the other. Each of these holes is so placed, that by rotating the disc on its corresponding side each of the colored glasses is in turn brought between it and the bull's eye of the lantern. Between the bull's eye and each opening in the plate there is an iris diaphragm, with indicators, showing the diameter of the apertures in millimetres. Between the diaphragms and the lamp two slips of glass, suitably mounted, are made to slide up and down. These slips are tinted neutral grey, the intensity being graduated from complete transparency at one end to almost complete opacity at the other. They were first made of neutral-tinted glass, ground wedge-shaped, but the great cost of such wedges led me to make them of graduated neutral grey tint myself at a very trifling cost from ordinary dry plate negatives suitably exposed to light, and developed. These slips are measured photometrically, and indexed accordingly.

By this means the opening for the light falling through a colored glass can be made to vary in size from 10 mm. diameter to pin point, and in intensity from light to dark. An almost unlimited variety of lights, both colored and "white," can thus be obtained. Both discs can be moved independently, as can also the diaphragms and glass slips.

For convenience sake I use the mirror method for testing, a method which I have employed for over twenty years in

my consulting room for Snellen's letters. I place the instrument on a table, with the mirror in front at 15 feet distant. I am seated to the right of the apparatus, the examinee to the left. I select one of the colors of the right disc, the iris, diaphragm, and tint slip having been suitably adjusted. The examinee is then instructed to turn the left disc so as to find a match for the signal light of the right disc. The colored glasses are partly chosen from various pairs and sets of confusion colors ("twin colors" and "triplet colors" of my previous tests). There are at present thirty in each disc, but half that number will probably be found sufficient.

The graduated neutral tint glass slips will be replaced by discs graduated in a similar fashion. These will be easier to fix, and therefore cheaper, than the sliding glass slips.

The lamp used hitherto has been the colza oil lamp. Although the flame was kept fairly steady, variations in the intensity of the light could not always be avoided, and in future the source of light will be a standard sperm candle, the unit adopted in all countries for measuring the intensity or quality of any light.

Advantages of the Instrument.—As already mentioned, I insist upon the matching of colors, and do not ask any question whatever as to their names. This is a point of paramount importance, which I cannot too strongly insist upon in any color examination. (For this reason the apparatus just described by Professor Eversbuch in von Graefe's Arch., l., i, June, 1900, is inadequate.)

If anyone should object to having the two colored signal lights side by side simultaneously, the one to be compared with the other, since in practical life, at sea and on a railway, it is a necessity to determine and interpret a single signal, the apparatus can be used in a corresponding manner. Either of the lights can be blocked out by a cover. One cover is removed first, a colored light shown, and the cover let down again. The examinee is then asked to match this signal from the other disc after the cover of his side has been lifted.

By narrowing the diaphragm we are able to detect the smallest central scotoma, the possibility of which has hitherto been completely neglected in all practical tests. They have not been looked for even in examinations with spectroscopic instruments; not that there need have been any difficulty in detecting them, but because their importance, and even their existence, has not been recognized. The selection of twin-colored signals is a saving of time and adds greatly to the practical utility of the apparatus.

The apparatus admits of the adoption of a standard for the quantitative measurement of color perception. I have hith-

erto used as the standard the lamp equal 1 candle power, 1 mm. diaphragm, 50 per cent of the light obscured, and a distance of 15 feet from the mirror equal (10 yards actual distance). I am, however, measuring this again, using the actual standard sperm candle in place of the colza lamp, and shall publish the results as soon as possible. (The colored glasses must, of course, be of a certain standard quality.)

We may by this means be enabled to form a standard as simple and as useful as Snellen's standard for form vision. With the average normal central color vision (C. V.) reduced to $\frac{1}{2}$ for red and green, rejection of the examinee is advisable; with C. V. reduced to $\frac{1}{4}$ it becomes an absolute necessity.

To secure accuracy each eye should be examined separately, and, though for practical purposes it would be quite sufficient if one eye only satisfied the color test, still it would be of great importance to know that such and such an individual was suffering from a defect of color perception in one eye."

Remarks on Color Blindness and the Tests to be Adopted for its Detection.

Eldridge-Green, F. W., (Ophth. Review, October, 1900). The writer gives a brief statement of his views of color-perception in the following words: "The perception of color is conveyed to the mind through a perceptive center, and this perceptive center is only able to distinguish six definite points of difference (colors) in the spectrum which really presents millions. We, therefore for the normal sighted, have a hexachromatic theory of color vision which is independent of light and shade. A hexachromatic theory will obviously explain all that can be explained by a trichromatic theory. It also agrees with the fact that both blue and violet have been demonstrated to be primary. The degrees and varieties of color blindness are perfectly explained by the theory. Assuming that the perceptive centre is smaller, fewer points of difference will be seen. The phenomena of contrast are explained on the view that color, being a point of difference, this becomes more marked on comparison. If we contrast a yellow with a greenish-yellow, the yellow inclines to orange, and the greenish yellow to yellow-green. This could not be explained by assuming that the colors differ by the addition of the complementary to each, as the complementary of yellow is blue, and this mixed with yellow would make white instead of orange-yellow."

The writer's theory as to the part played by the retina, which is supported by numerous experiments, is that "light acting upon the retina liberates the visual purple from the rods and a photograph is formed, the cones conveying the im-

pression of the photograph to the brain." He believes that "shortening of the spectrum is due to some defect in this visual substance, as it may be met with in otherwise normal-sighted persons, and there is light as well as color loss."

From the experiments which the writer has made during the last ten years, and from evidence supplied by others, he feels convinced that not only is there a visual substance, but that that substance is purple; he answers the arguments of Kuhne, who has maintained that the visual purple could not be essential to vision and could not be the visual substance. He also defends his assumption of a color-perceiving center in the brain, and states that opinion has steadily grown in favor of the view that a central lesion may be the cause of color-blindness.

The Chromoscope: A Convenient Instrument for Studying the Color Sense of the Macula Lutea and its Anomalies.

Knies, M., Freiburg (Arch. of Ophth., September, 1900). While studying certain anomalies of the color sense, the writer determined the limits of the various colors in the spectrum as seen by persons with normal and abnormal color-perception. With the same individual, there were but slight variations; but with different individuals, even when their color-perception was perfect, there were greater variations. This explains why the limits of the various colors in the spectrum have been differently stated in literature.

Knies begun his experiments on himself, using a Bunsen spectroscope, and an Auer burner, his first purpose being to determine the limits of the spectrum as regards the perception of color only. For purposes of comparison of various eyes, he employed an arrangement with which the red end of his spectrum fell at 173 of the arbitrary scale (the sodium line D being taken as 200), and the violet end at 293. For his own eye, red had its greatest intensity at 189, and violet at 276, neutral yellow at 202, neutral green at 215, and sea blue at 228. The results arrived at after transposing the arbitrary scale of the spectroscope into wave-lengths are expressed in millionths of a millimetre. The differences in different individuals were found to be very slight.

Continuing, the writer says it would be too cumbersome to use a spectroscope in each case in which the color sense is examined, and the more important fixed points in the spectrum (excepting neutral green) can be determined in a much simpler manner. "When I look at a white strip on a black ground through a prism in such a manner that the well-known colored margins appear, while the middle of the strip remains colorless, I see the following: On one side of the spectral image red begins and, without markedly changing its hue,

grows more intense and then passes over rapidly through orange to yellow, which fades away into the white of the middle of the strip. On the other side of the strip I see the violet becoming more intense, and then passing over rapidly through indigo to marine blue; which fades away to white towards the middle of the white strip. In this way four principal colors are seen which correspond to the above-mentioned colors, and can be readily matched with the colored yarns.

In order to carry out such examinations quickly and conveniently, I have constructed a small instrument which I have called a chromoscope. This is essentially an arrangement for exhibiting the colored margins of a white strip without distracting the attention by any other spectral phenomena. It consists of a box lined with black velvet, whose front side can be turned down nearly to the horizontal. On the opposite side, above, is a small projection on which is mounted a flint-glass prism, having an angle of 60 degrees. A strip of white paper 5-10 mm. broad is viewed through the prism, one margin or the other being brought into the field, and the patient is asked to select a skein of yarn similar to the color seen, without calling it by name.

Persons with a normal color-sense select the same hues as I do myself; the end colors of the spectrum, red and violet (any deviation here is abnormal and indicates a shortening of the spectrum), and then a neutral yellow and a marine blue. There may be a little uncertainty above the middle colors, and a greenish blue skein may be selected and even called green.

If now the observer's color sense is abnormal, other colors are seen and other skeins are selected which are characteristic for the sort of color-blindness existing.

What v. Kries found by painstaking examinations and measurements, viz., that there are two sharply differentiated forms of congenital color-blindness: protanopes (red-blind) with a maximum perception in greenish yellow, and dauteranopes (green-blind) with a maximum perception in orange and blue, can be discovered with the chromoscope at a glance. The affected person will select at once the proper blue and either yellow or reddish yellow.

It is very interesting to determine with the chromoscope those color anomalies which arise in progressive diseases of the optic nerve and similar processes. In the beginning four colors are chosen here also, but other than the normal colors. The two inner colors of the spectrum, yellow and marine blue or greenish blue, are normally perceived; but instead of red, yellowish red or, later, reddish yellow will be selected, and in place of violet, which is the first color to be lost, the patient selects various hues of indigo up to cyan blue. This indicates

a shortening of both ends of the spectrum. So long as four distinctly different colors are recognized in the chromoscope, green will be recognized. Then the condition becomes such that only yellow and blue are seen, just as in congenital color-blindness, except that here the acuteness of vision also has suffered. The two colors seen in the chromoscope become gradually fainter until no color at all is seen in the middle of the spectrum. Actually perception of violet is lost first, then of green, then of red.

The examination with the chromoscope, of course, only gives us information as to the color perception at the macula. It must be supplemented with color perimetry, in which more attention should be given to tests with violet than has hitherto been done.

Examination with the chromoscope has also led, as the following paper will show, to the discovery and accurate determination of a previously ignored congenital color defect, a knowledge of which is of great theoretical importance, though its presence leads to but slight clinical symptoms.

On a Frequent but Hitherto Unrecognized Form of Congenital Violet-Blindness and on Color Anomalies in General.

Knies, M., Freiburg, Baden, (Arch. of Ophth., September, 1900). The writer alludes to a previous description of an anomaly of color perception in which violet is not seen while the color sense is normal for the other colors, and complains because his report was almost entirely ignored. He does not consider this anomaly as particularly rare, and regards it as frequent as Helmholtz's red-green blindness or Hering's confounding of red and green. The discovery of this anomaly is facilitated by the use of the chromoscope. (See previous abstract.) The main points in the writer's paper are the following:

"1. Besides the well-known anomaly in which only two colors are seen, there is another still more frequent anomaly—violet-blindness—in which the remainder of the spectrum is seen correctly, and at least three fundamental color-perceptions must exist.

2. This color anomaly accords neither with the Helmholtz nor with the Hering theory.

3. The chromoscope is a very convenient instrument for determining the color sense of the macula.

4. I myself believe that the four colors seen in the chromoscope are the fundamental colors for that particular individual. These may differ at different times in the same person if there is disease of the optic nerve.

5. According to their number and location in the spectrum, I differentiate the congenital color anomalies with normal

anatomical and ophthalmoscopic conditions into: (a) two forms, each with two fundamental colors, the most fitting designations for which are: yellow-blue seeing and orange-blue seeing (red-blindness and green-blindness of Helmholtz, protanopes and deutanopes of v. Kries, and red-green blindness of Hering); (b) a form with as many fundamental colors as the normal-sighted possess, which is best designated as violet-blindness since this is its prominent characteristic, although there is a shortening of the long-waved end of the spectrum which, measured in wave-lengths, is almost as great as the shortening of the short-waved end—(perception of four colors, with contraction of both ends of the spectrum).

6. All three of these forms of congenital color-anomaly are to be regarded as states of a less advanced development of the color perception. The latter develops in extra-uterine life in a way contrary to that in which it is lost in disease of the optic nerve. The three congenital anomalies of color are the three principal stages in the development of the color sense. Intermediate stages may at times come under observation, but these are very rare."

What Amount of Visual Defect Should Disqualify in Railroad Service.

Allport, Frank, Chicago, (Journ. Amer. Med. Assn., October 13, 1900). In order to ascertain what is being done in railroad circles in the matter of examining railroad employees for defects of sight and hearing, the author sent a letter of inquiry and a question blank to 244 railroads in the United States, Canada and Mexico, and received replies from 64 roads. From these he finds he has learned sufficient to obtain a reasonably good idea as to what representative railroads are doing in the way of eye and ear examinations. He has arranged the replies in a statistical table which he publishes in his paper, together with a critical analysis of the same.

The results show that on all points bearing on the visual and aural capacity of railroad employees there is much diversity of opinion on the part of the employer, employed railway surgeons, as well as eye and ear surgeons. Hence the writer offers the following practical suggestions with the hope of obtaining some uniformity in the regulations on this important subject:

"1. The essential principle to be advocated is that railroad corporations shall require a scientific and correct entrance examination of the eyes and ears of those employees at all to be concerned with the active operating of trains, or in giving or receiving signals.

2. Such examinations are best made by regularly appointed eye and ear surgeons. But if such a course is not deemed advisable, the company surgeon, aided by his medical assistants, may conduct them, with the understanding that all doubtful cases shall be sent to a regularly appointed eye and ear surgeon. Non-medical men shall never conduct the examinations.

3. There shall be two general standards of visual and aural requirements, viz., those for new men hoping to enter the service, and to be actively engaged in the operation of trains, and in giving and receiving signals, and secondly, those men engaged in similar work, who have been uninterruptedly in a company's service for five years, and who have, therefore, a right to be called old employees.

4. New men shall be required to possess perfect color sense. They shall also have a vision of 20-20 in each eye, without glasses, and have healthy eyes, and not over two diopters of hyperopia. They shall also hear the whispered voice at twenty feet in a quiet room, and have healthy ears.

5. For purposes of graduated requirements, old employees shall be subdivided into two classes, as follows: Class A—Engineers, firemen, conductors, brakemen, switchmen, signalmen, switchtenders and engine dispatchers. Class B—Track foremen, bridge foremen, crossing flagmen, bridge tenders, gatemen, trained baggagemen, telegraph operators, station agents and station baggagemen. Employees enumerated in Class A shall not be retained in such positions if vision sinks below 20-30 in one eye and 20-40 in the other, or if the whispered voice cannot be heard in a quiet room at fifteen feet by one ear and ten feet by the other. Employees enumerated in Class B shall not be retained in such positions if vision sinks below 20-40 in one eye and 20-50 in the other, or if the whispered voice cannot be heard in a quiet room at ten feet by both ears. Employees, and especially engineers and firemen enumerated in Class A, must reach the visual standard without glasses, and will not be allowed to wear distance glasses when on duty. Employees enumerated in Class B may reach the visual standard with glasses, and will be allowed to wear glasses when on duty, and will be required to do so if the wearing of glasses is necessary to bring vision up to the proper standard. All the employees shall have perfect color sense.

6. Re-examinations shall be made of all men every three years, and after a severe illness, or accident, or any occurrence which seems to cast doubt on the visual or aural capacity of an individual. Re-examinations shall also be made more frequently on men known to be excessive users of to-

bacco, or to be suffering from syphilis, albuminuria, diabetes, or acute or chronic eye and ear disease. Men shall always be examined before promotion.

7. Men known to be excessive users of liquors shall not receive employment.

It would seem as if these rules were sufficiently comprehensive and liberal to be adopted by any railroad. At the same time, they are believed to be sufficiently stringent to exclude dangerous eyes and ears from the service. They will, of course, exclude a certain proportion of old employees from their accustomed occupation, but this is of small moment, compared to hazarding the lives and property of the public by the retention in service of physically incompetent men. Railroads can always, if they choose, lessen the disappointment of an old employee, by transferring him to some other and less hazardous position with a liberal salary."

On the Advantages of Strong, Portable or Easily Movable Magnets in Eye Surgery.

Lippincott, J. A., Pittsburg, (Trans. Am. Ophth. Soc. for 1900, and Ophth. Review, September, 1900). The writer mentions the frequently insufficient traction-power of the electro-magnets of Hirschberg and Bradford, and the permanent magnet of Gruening as disadvantages; he states also that the Haab magnet, though very valuable and useful, is handicapped by its comparative immobility. He has had a magnet constructed with high drawing power, and yet small enough to be readily manipulated when suspended from the ceiling. This instrument is 12 inches long and two and a half inches in diameter. "Into the end of the core, which is seven-eighths of an inch in diameter, can be screwed the tips belonging to the Hirschberg magnet. Of these I use two, a short tip, one inch long and with a flattened point three-sixteenths of an inch one way and one-tenth inch the other, and secondly a long tip, one and a half inches in length and terminating in a rounded point one-sixteenth of an inch in diameter—small enough to be introduced into the globe, if necessary. With this magnet I have lifted a mass of iron weighing 51 pounds."

"The instrument weighs nearly 9 pounds and is therefore too heavy to be easily manipulated without other support than that afforded by the unaided hands. Suspended, however, by a wire cord attached to its center and passing through two pulleys in the ceiling, and balanced by a counter weight at the other end of the cord, the instrument may be handled with a minimum of effort and may be held in any desired position while operating. Among the advantages of such a magnet as this, or the beautiful instrument described

by Dr. Johnson in the Archives of Ophthalmology for May, 1899, are in the first place that the presence of the metal in the eye can usually be diagnosticated, and its location actual or approximate, frequently determined, and this without the loss of time required by the use of the Roentgen Ray apparatus. I fall back upon the latter, however, in suspicious cases in which, nevertheless, the magnet gives no sign. These cases are rare in my experience. In making a diagnosis with a magnet the signs upon which reliance is placed are: First, a sensation of pain or discomfort elicited, and second, a perceptible movement of the ocular tissues produced, when the instrument is brought sufficiently near the foreign substance in the eye. The first of these phenomena is manifested in the great majority of cases in which the foreign body is situated elsewhere than in the lens. When it is in the lens there is no sensation, but movement can usually be observed on close examination. If the substance is in the iris or immediately behind it, both sensation and movement are exhibited. With the object of attaining greater accuracy in locating the foreign body, I have had a telescopic tip made with the object of reducing the strength of the magnet to the point at which the minimum of either pain or movement or both can be elicited. If the tip is moved in gradually diminishing circles, we can frequently settle on a small area within which either sensation or movement is most pronounced. During the examination the patient is instructed to hold the eye in every possible position. By strong rotation of the globe upwards, downwards, outwards, and inwards the posterior quadrants can be satisfactorily investigated. I have not used the Haab magnet, but its size obviously makes such refinement of diagnosis difficult if not impossible.

Cases occasionally occur in which the foreign body is so small that the X-Ray test must in the nature of things be negative. As illustrative of such a condition of things I beg to exhibit a fragment of steel diagnosticated and removed about three weeks ago. From the size of the object, which is only about $\frac{1}{4}$ mm. in length, skiagraphic investigation must necessarily have been fruitless. In this case the evidence furnished by the magnet was absolutely conclusive. Whether the diagnosis could have been made with the sideroscope of Asmus I am unable to say, as I am not familiar with this instrument; but from the reports which I have seen I should judge that the conditions for its employment are too stringent to permit of its finding a wide field of usefulness.

It is needless to say that to use the magnet for diagnostic purposes, accurate and painstaking observation is often necessary. I have sometimes failed, generally owing to insufficient light, to make a positive diagnosis at the first trial.

Occasionally the test is entirely negative. In one instance the approach of the magnet caused no pain, although there was a thin strip of steel 20 mm. long and $1\frac{1}{2}$ mm. wide in the globe, one end having penetrated the posterior inner wall. Notwithstanding the failure of the test in this case, enucleation was at once advised, without even waiting for an X-Ray examination, because the vision of the other eye was already seriously compromised, the ophthalmoscope revealing a pronounced sympathetic inflammation of the optic nerve and retina. While cases of this character show that the magnet test has its limitations, and that, when negative, it is not to be regarded as final, they by no means detract from the value of the positive evidence so frequently and so promptly furnished by the instrument."

The writer also claims advantages for the movable magnet in operating when general anesthesia is necessary or when the recumbent posture is desirable. After an incision into the eyeball, it is important to bring the magnet within working distance as speedily as possible, and in almost any case it will be found more convenient to move the magnet towards the patient than the patient to the magnet.

A brief account is given of fourteen cases in which the writer used the magnet for diagnostic or operative purposes during the past year. In ten of the cases, the metallic particle was situated in the anterior part of the globe; nine of these were operated upon with good results. Of the four cases in which the metal had lodged in the vitreous, the only one which could be expected to end favorably is too recent to give the result; one required enucleation on account of sympathetic neuro-retinitis, and the other two recovered quantitative vision with quiet eyes.

Massage of the Eyeball.

Wood, Casey A., Chicago, (Journ. Am. Med. Assn., November 17, 1900). The writer prefers simple massage with the tip of the finger to any form of the instrumental variety, such as direct rubbing with pieces of cotton wool mounted on a shaft, the tapottement or tetanization of Maklakow, the use of sounds or other devices. In the main, he prefers indirect massage with the pulp of the finger placed on the skin of the lid, to direct massage in which the finger tip is applied to the surface of the cornea or conjunctiva.

The principal points to which attention is drawn are the following: The amount of force to be used, the length of each sitting, the frequency of applications, the strength of the remedial agents employed with the rubbing, and the susceptibility of the patients; the consideration of these points is of importance in the successful employment of massage. Indi-

rect massage should never produce pain, and rarely more than passing discomfort. The frequency of applications varies from once a day to twice a week. Each sitting should rarely exceed three or four minutes. When the procedure is used merely for the purpose of massage, Dr. Wood instills a drop or two of cod-liver oil or of pure castor oil. He considers mercurials of various strengths, combined with oleaginous excipients, the most useful medicinal agents in massage. At the end of, or during the massage, combinations of the remedy with the ocular secretions especially mucus, should be coaxed out of the sac by small "dabs" of damp cotton or the irrigating stream, and the stroking movements resumed until nothing further comes away.

The writer finds the most satisfactory employment of massage in chronic diseases of the lid-borders and substance, in almost all the sub-acute and chronic forms of conjunctivitis, in most forms of ulcer and deposits of the cornea; it may also be employed for the temporary relief of glaucoma, and in some forms of retinal embolism. He believes it is not indicated in the early stages of acute conjunctivitis and keratitis, nor in any form of true trachoma, spring catarrh, disease of the iris, ciliary body, lens, choroid, vitreous, or optic nerve.

Use and Abuse of Potassium Iodid in Ophthalmic Practice.

Baker, A. R., Cleveland, (Journ. Amer. Med. Assn., November 17, 1900). The writer places much confidence in the use of large and rapidly increasing doses of potassium iodid, not only in specific affections, but also in other conditions where an absorbent action is desired. His method of administering the drug, which he usually combines with bichlorid of mercury, is as follows:

R Potass. iodid. 3i
Aque q. s. ad. 3i

This formula he uses as a menstruum for the administration of the larger doses, and gives this prescription:

R Hg. Chlor. cor. gr. i
Potass. iodid. 3i
Tr. cinch. comp. 3ii
Aque q. s. ad. 3iv

With instructions to add 5 drops to each spoonful of the first prescription, increasing 5 drops additional with every dose, thus giving 45 grains the first day, 60 grains the second, 75 grains the third, and thus rapidly increasing the dose up to 500 grains daily. He urges the patient to drink an abundance of water, to eat well, and to take frequent hot baths. He cautions the patient not to take the medicine if a full meal has not been taken, and on the first indication of intestinal

disturbance to stop the drug entirely for a day or two. Administered in this manner, he rarely meets a patient who cannot take from 100 to 300 grains daily.

The writer summarizes his observations as follows: "1. Iodid of potassium should generally be administered in rapidly increasing doses until from 1 to 500 grains are given daily. 2. The drug should always be given after eating, and well diluted with water. 3. Frequent hot baths are essential to the best results in the use of the remedy. 4. Not infrequently large doses will be tolerated when smaller ones cannot be well taken. 5. The use of the large dose is not limited to syphilitic cases. 6. Large doses are indicated in: Optic neuritis, ocular paralysis, choroiditis, serous iritis and in relapsing iritis; cyclitis, and in interstitial keratitis. 7. It is contraindicated in gray atrophy of the optic nerve, and in most cases of postneuritic atrophy. 8. Albumen in the urine, generally speaking, is a contraindication for large doses of iodid. 9. Young children do not take the iodid kindly, and it should be administered cautiously. 10. The remedy is of doubtful value in early syphilitic iritis. 11. Large doses are of doubtful utility in the removal of post-operative exudates, but should be given further trial."

The Face and Pupil in Alcoholic Neuritis.

Brunton, T. Lauder, London, (The Lancet, December 1, 1900). In the course of a short article bearing the above-mentioned title, the writer calls attention to the following pupillary signs: "Another point is the condition of the pupil reflex, which is just the converse of the Argyll-Robertson phenomenon. In a number of cases of alcoholic neuritis I have noticed that the reflex of the pupil to light is rapid and extensive, whereas the contraction of the pupil on accommodation to a near object is slight and sluggish or entirely wanting. Indeed, in one or two cases I have observed a dilatation instead of contraction on accommodation."

The Significance and Pathology of the Argyll-Robertson Pupil.

Harris, Wilfred, London, (Brit. Med. Journ., September 29, 1900). The writer states that this sign is met with most commonly in tabes and in general paresis, diseases which are due largely if not entirely to previous syphilis. He believes that the loss of pupil contraction to light to be an almost certain sign of syphilis, acquired or congenital; hence it is met with, not infrequently, unassociated with tabes or general paralysis in syphilitic subjects showing otherwise no symptoms, or suffering from other syphilitic lesions. In addition to tabes and general paresis with a history of acquired syphilis, he has met with the Argyll-Robertson pupil in juvenile lo-

comotor ataxia and general paralysis with a history of acquired syphilis, progressive muscular atrophy, lead poisoning, aortic aneurysm, hemiplegia, syphilitic meningitis, ataxic paraplegia, choroiditis, and in numerous instances in patients who presented themselves for all manner of symptoms, but showing no signs of ataxy or anesthesia, and with normal or even brisk knee-jerks, but with in almost every case a clear history of syphilis. He states, further, that the appearance of the pupils in which the light reaction is lost may vary considerably. Both may be small or large; in the latter case their power of contraction on convergence is usually lost or very slight. The pupils are frequently unequal.

The very small pupils often met with cannot be explained simply as paralytic miosis, since they are smaller than is ever met with in sympathetic paralysis; nor by a continual irritative process affecting the sphincter center in the third nucleus. He believes their small size to be due in part to a contracture of the sphincter muscle, as they dilate only partially under atropin. In twenty cases he has seen unilateral loss of light reflex, but usually it is impaired on both sides, being more marked in one than in the other, this being probably only a stage in the development of complete loss of light reflex in both eyes.

When unilateral reflex iridoplegia is present, it is important to test the consensual reactions to light, and it will be found that the sound pupil, if shaded, will contract if light is focussed on the affected pupil from any direction; this proves that the afferent part of the reflex in the optic nerve is intact, and disproves the possibility of a nuclear lesion in Argyll-Robertson pupil, if the usually accepted diagram of the course of the light fibres be correct.

The morbid anatomy of the Argyll-Robertson pupil, though never demonstrated, has been variously surmised to depend on a nuclear lesion, on sclerosis of Meynert's fibres between the anterior corpora quadrigemina and the third nucleus, or even on a lesion of the ciliary ganglion. The third nucleus, or its anterior portion, is certainly included in the reflex arc, and it is not surprising, therefore, to find the phenomenon of reflex iridoplegia present in cases of nuclear lesion. The writer does not, however, consider this sufficient argument for placing the usual site of the lesion in the nucleus, inasmuch as the vast majority of cases of Argyll-Robertson pupil are unaccompanied by any other signs of nuclear lesion. Analogy, too, would rather suggest sclerosis of certain fibres, in view of its frequent association with posterior sclerosis, in which lesion of nerve cells is a rare exception.

The study of the pupil reflex in birds and animals, with and without binocular vision, proves that the two third nuclei are

not tied together for the light reflex, since only the pupil exposed to light contracts; moreover, in birds and lower mammals there is complete decussation of the optic nerves at the chiasm, and it therefore follows that there must be also a posterior decussation of the fibres subserving the light reflex between the optic lobes and the third nuclei. It is highly probable, therefore, that in man and in other animals with binocular vision, in whom there is semi-decussation of the optic nerves at the chiasm, that a similar arrangement holds good between the anterior corpora quadrigemina and the third nuclei, namely, that there is a semi-decussation of the fibres subserving the light reflex between these two parts.

Continuing, the writer says that Meynert's fibres have been shown by Boyce and others to be not a complete decussation, some fibres remaining uncrossed in or close to the posterior longitudinal bundle of the same side, and it seems not improbable that these fibres have the above function. This being the case, it is no longer necessary to conceive the two third nuclei being tied together in order to explain the consensual reaction of the pupils to light, as light thrown on either pupil in any direction will thus cause afferent stimuli to reach both third nuclei independently. It seems to Harris much more probable, then, in the absence of direct pathological evidence, that the Argyll-Robertson pupil is due to sclerosis of these fibres on one or both sides, according as the loss of light reaction is unilateral or bilateral, rather than due to any nuclear degeneration, such as has been suggested. Considerable atrophy of the plexus of nerve fibres beneath the layer of nerve cells of the anterior corpora quadrigemina has been noted in cases of tabes, though the sclerosis of Meynert's decussation is probably so slow that it will possibly never be demonstrated by Marchi's osmic acid method of staining, and it would not be sufficient to show by the negative method of staining of Weigert-Pal.

Influence of the Eye on the Growth of the Orbit.

Thomson, W. Ernest, Glasgow, (*The Lancet*, November 17, 1900. Report of November meeting of Ophth. Soc. of the United Kingdom). Dr. Thomson gave the results of experimental enucleation of one eye in young animals undertaken in order to determine whether removal of an eye in early life resulted in faulty development of the orbit. Such faulty development had been both asserted and denied, although experimental evidence had seemingly been hitherto wanting.

One eye in a series of rabbits was enucleated under ether about the twentieth day of life. The animals were kept for periods varying from six to eight months, and were then kill-

ed. The orbits were carefully measured and the results found to be a very marked difference between the normal and the anophthalmic side. The deficiency was very uniformly distributed over the length, height, and depth of the orbit, and amounted to something like 10 per cent in the macerated skull and from 10 to 15 per cent in the wet condition. It thus appeared that the greater fault was in the development of the bones, and the lesser in that of the soft tissues.

Orthoptic Treatment of Convergent Squint in Young Children.

Worth, C., (Brit. Med. Journ., October 27, 1900. Report of October meeting of Ophth. Society of United Kingdom). Mr. C. Worth said that the treatment adopted by some surgeons was as follows: The refraction was corrected and glasses were worn constantly. In nearly 30 per cent of constant monolateral squint this treatment sufficed to render the eyes "straight," and in some of them binocular vision was obtained and the case was cured. In the 70 per cent which were not cured by glasses operative treatment was postponed until the age of 7 to 8 years, but only a small proportion of these obtained binocular vision, the time having gone by when this might have been developed. There were three chief difficulties to be overcome in carrying out orthoptic treatment in young children. (1) The child would only submit to treatment so long as he found it interesting; (2) the suppression of the vision of the squinting eye; (3) the angle of the squint was usually so great that an ordinary stereoscope could not be used even if there were no suppressions. This latter difficulty was overcome by an instrument invented by the author, which could be adapted to suit a squint of any angle or direction, and so stereoscopic vision was possible. The instrument was shown and carefully described. He found that those who saw binocularly naturally arranged themselves into three distinct classes, according to the degree in which they possess this faculty; thus—first grade, simultaneous macular perception; second grade, true fusion with some amplitude; third grade, sense of perspective. Mr. Worth then described the treatment; before commencing it the visual acuity of the child's squinting eye was obtained in the manner which he described. The instrument was then adapted to suit the angle and direction of the squint and a cage, for instance, was shown before the fixing eye and a bird before the squinting eye. The child then saw only the cage with the fixing eye. The illumination of this was gradually diminished while that of the bird was increased, until the bird was seen. Should the cage then have disappeared, the illumination was modified until the bird was seen in the cage. Many other devices were used, until the patient learned to blend the two images,

and so reached Grade 1. After a while the angle of the instrument might be altered slightly without destroying the picture; the eyes followed the object and maintained fusion, and so Grade 2 was reached. Exercises were then continued until the third grade of binocular vision was obtained. Next, the illumination of the object slides was gradually equalized, and then an attempt was made to separate the mirrors more and more, while the visual axes followed the deviation of the objects. The author had carried out treatment in some hundreds of cases, and in a large proportion it had caused a disappearance of the squint and the acquisition of the highest grade of binocular vision. In other cases, the squint did not disappear. An occasional visit with exercises was sufficient to preserve the fusion faculty until the child had arrived at an appropriate age for operation. The desire for fusion then overcame any slight defect, which might remain and a perfect cure resulted. The special points of this instrument were: (1) Its adaptability to any form or degree of squint, including those cases in which the globe was rotated about an antero-posterior axis; (2) suppression of vision of squinting eyes was gradually overcome by unequal illumination; (3) the variety of devices shown in the instrument interested and amused the child, so that he would readily give all the help he could at a most important point."

The Effect of Converging Prisms Upon our Notions of Size and Distance.—An Experimental Study.

Duane, Alexander, New York, (*The Ophthalmic Record*, December, 1900). The writer records the results of his experimental investigation of the physiological effects due to converging prisms, upon himself and upon others. From these experiments he makes the following deductions:

"1. In the great majority of cases the effect of a converging prism was to make a distant object appear either smaller or more remote. 2. Both the apparent recession and the apparent diminution increased *pari passu* with the amount of convergence employed. 3. In some cases the apparent recession of the distant object seemed to be the primary effect produced by converging prisms, since this recession was noticeable even with a prism that was too weak to cause any diminution in the apparent size of the object, and since also with all prisms it was more marked than the diminution. In other cases the diminution in size seemed to be the primary effect. 4. In but a single instance (and that a very uncertain one) was the distant object alleged to look nearer. 5. In no instance was it alleged to look larger. 6. In the few cases in which no effect was produced upon the apparent size or distance of an object across the room, the amount of converg-

ence employed was usually small, and the analogy of others would lead us to suppose that with stronger prisms a decided effect would be produced, both upon the size and distance. 7. The effect upon the apparent size and distance of objects seen through converging prisms was less pronounced in those who from the start used but little accommodation in converging. On the other hand, it seemed particularly marked in those whose sight, at first blurred by the excessive accommodation employed, cleared up afterward through relaxation of the accommodation. Objects, as soon as they became distinct through this relaxation of the accommodation, appeared small and far off. 8. In addition to a concave glass, clearing up the sight that was blurred by the overplus of accommodation used, had no effect upon the appearance of the diminution and recession produced by prisms. 9. The effect of homatropine pushed to the point of complete relaxation of the accommodation was in some cases to make the object appear further off, but no smaller. 10. In fourteen cases out of sixteen examined, the effect of looking through converging prisms at an object near by, (eighteen to thirty inches) was to make it appear smaller. This diminution in size was generally very marked, even with weak prisms—much more marked, indeed, than for distance. 11. Near objects generally looked more remote, although sometimes they looked nearer than they really were. With strong prisms the recession may be very pronounced. 12. In all out of six cases examined under homatropine, a near object looked either further off or smaller or both further off and smaller, the effect was usually a decided one.

The explanation of these phenomena is still somewhat difficult, although the experiments above described strongly indicate that the accommodation or rather, as I originally stated, the relaxation of an unnaturally tense accommodation, is the prominent factor in their production. I am inclined to think that it is the disturbance of the normal relations between accommodation and convergence, brought about by the use of converging prisms, that is chiefly responsible for the diminution in size that most people observe in an object seen through a prism of this sort. The recession, that is also generally noticed, seems partly due to the same cause, but is considerably influenced by the effects of contrast and perspective. The psychical element, too, must not be ignored. Many people tell us what they think they ought to see, rather than what they really do see, and even those who try to give an accurate description sometimes pervert their actual impressions since they correct by mental effort what they know to be an illusion."

On Accommodation in Aphakic Eyes.

Walther, O., Odessa, (Archives of Ophth., November, 1900). Admitting that accommodation in the normal eye is due directly to a change in the form of the lens, the writer takes up the question whether the anatomical structure of the eye is not such that under certain conditions lenticular accommodation may be replaced by another sort of accommodation. He reviews the work which has been done in this direction by Foerster, Donders and others, giving the views of many observers, and adds a case of his own. Working out the physics of the matter, he comes to the following conclusions:

"1. If the accommodation of aphakic eyes, especially such as I have described, is caused by an increase in the long axis, this increase must be 2.7 mm. for the reading distance. An external accommodation caused by muscular pressure in the convergence position is claimed among others by Schneller. Schneller's investigations were subjected by Sattler to a most careful physiological examination, and Sattler came to the conclusion that no external accommodation takes place. His histological investigations of the sclera also lead him to the conclusion that such a distension of the eyeball is improbable. In the present case it must be remembered that the eye was highly myopic, with an extensive sclerectasia, and doubtless an abnormal weakness of the coats of the eye, and particularly the sclera; it might be supposed then that the pressure of the extrinsic muscles would, in this case, be more likely to have some effect. Nevertheless, a distension of nearly 3 mm. is considerable, and it is doubtful whether this effect could be produced in the slight convergence necessary for fixing an object 30 cm. away. Besides this, a portion of the radial fibres of the ciliary muscle run backward to the sheath of the optic nerve, where they find their insertion, and a contraction of the ciliary muscle must bring the two points of the insertion nearer together, thus shortening the sagittal axis. In my case it was incomprehensible why such an extension was possible in the right eye and not in the left, when the pathological changes were alike in both. Finally accommodation took place when the left eye was covered and no effort at convergence was made, the left eye maintaining the position it had when fixing an object in the distance.

2. If the accommodation in aphakic eyes is due to an increased convexity of the cornea, the radius of curvature must be diminished 0.5 mm. for fixation of an object at 30 cm. In my case no change was detected in the corneal image of a flame by the coarse test at my disposal, but no such change has been positively determined even by ophthalmometric examination. An increased intraocular tension from compres-

sion of the eye could not cause such an increased curvature of the cornea since, as we see in glaucoma, increased tension rather causes a bulging of the sclero-corneal ring and thus flattens the cornea. An increased curvature of the cornea could therefore be explained only through a contraction of the circular fibres of the ciliary muscles, yet, apart from the fact that such a result would be very improbable, there is no reason why such a result should occur in one eye and not in the other, since the condition of the cornea was the same in both. We therefore dismiss this explanation.

3. If the accommodation of the aphakic eyes depends upon an increased refraction due to an altered form of the anterior surface of the vitreous, it can only take place when there is a marked difference in refractive index between aqueous and vitreous. Accommodation would then be favored by a round and narrow pupil, and would be in inverse relation to the thickness and rigidity of the remaining posterior capsule of hyaloid membrane. From the fact that the condition of the vitreous may be widely different in different eyes, we are also justified in believing that its refractive index may vary greatly, for the presence of even a greater or less quantity of salt in a liquid is sufficient to alter its refractive index. With the assistance of this theory we are enabled to explain satisfactorily the difference in function in the otherwise similar eyes of our patient. A dissection of the secondary cataract was made in the right eye, the vitreous could communicate with the anterior chamber through this opening, and, under the pressure of the ciliary muscle, could protrude unchecked into the anterior chamber. In the left eye, on the contrary, the hyaloid membrane remained intact, and there was a slight secondary cataract, two conditions which must greatly diminish any such play of the vitreous.

I am fully aware that there are many gaps in my argument and I do not wish to draw positive conclusions from a single observation and theoretical arguments, but I shall consider my purpose accomplished if others will test my observations and conclusions, and undertake an experimental study of the matter. The latter would include not only careful clinical examination of myopes and others who are aphakic, but the determination of the refractive indices of the media in a large series of cases. The vitreous should receive special attention, since it is to be considered not as a homogeneous mass, and it should be studied entire. The conditions are now such that I cannot undertake such studies myself."

ABSTRACTS FROM ENGLISH COLONIAL OPHTHALMIC LITERATURE.

BY FRANK ALLPORT, M. D.,

CHICAGO, ILL.

(QUARTER ENDING DECEMBER 31, 1900.)

Diffuse Punctate Condition of the Fundus.

Hamilton, Dr. T. K., (*Australasian Medical Gazette*, October, 1900). Dr. Hamilton presents a case similar to the one described by Dr. Shumway in the *Annals* for October, 1900.

The patient, a male, 40 years old, has good vision during the day and at night, but in twilight his vision is very poor. Exposure to bright light during the afternoon will make him almost blind at dusk.

The fundus of both eyes, except in the macular regions, is studded over with closely aggregated, dull, yellowish-white spots, soft in outline and varying in diameter from that of a retinal vessel to several times their size. There are no pigment spots in the retina nor any areas of choroidal atrophy. The right eye, after the refractive error is corrected, has vision 6-12, the left eye after correction has vision 6-6. The fields show some contraction for all colors, but no scotomata.

His chief symptom is the nyctalopia at dusk and wearing smoked glasses during the afternoon, relieves this trouble somewhat.

Application of Epithelial Lip-flaps on the Eye-ball after Removal of a Lipoma and Pterygium (Ibid).

The patient was a female, aged 35 years. The pterygium extended 4 mm. on the cornea, and was attached at its base to a lipoma, which extended from the caruncle and downwards to the fornix, forming a symblepharon. The lipoma measured about 1.50 cm. and was very thick. The pterygium was removed in the usual way, cut off at its base, and the lipoma also dissected off. The raw surface left was then covered by an epithelial flap from the lower lip. No sutures were taken, but the edges of the flap were tucked under the undermined margins of the conjunctiva above and below. The eye was closed with a pad and collodion, and a double bandage worn for twenty-four hours. Union was perfect when the eye was first opened. At the end of ten days the flap sur-

face looked almost like the surrounding conjunctiva, and the symblepharon was entirely relieved.

A Case of Fracture of the Skull Associated with Unusual Ocular Movements.

Hawkes, Dr. C. S., (*Australasian Medical Gazette*, August 20, 1900). A boy, 9 years old, was thrown from a horse and struck the left side of his head. He was partially unconscious. There was no skin wound, but a hematoma below the left parietal eminence. From the left ear there was a steady ooze of blood stained fluid. A tear was found in the posterior half of the tympanum and through this tear the fluid could be seen oozing. There was no paralysis of the face or limbs, the knee-jerks were normal, the pupils were equal and reacted to light and on accommodation; the fundi were normal and remained so. There was a rotary nystagmus of both eyes without any lateral nystagmus. The wheel-like movements occurred from twenty to twenty-eight times a minute. Any attempt at convergence would increase the nystagmus, and it continued during sleep. After the second day the movements became gradually less, until by the fifth day after the injury they were no longer perceptible, but for several days after they were apparently gone they could be induced by causing the eyes to converge.

Any movements of the eyes secondary to aural affections are uncommon, though not unknown. Affections of the nerve, labyrinth, middle ear, or rarely of the external auditory meatus, may cause these movements of the eyes and nystagmus has been experimentally produced by draining the perilymph space and injecting air.

Interstitial Keratitis.

Gibson, Dr. J., Lockhart, (*Australasian Medical Gazette*, September 20, 1900). Dr. Gibson emphasizes these points, (a) Interstitial keratitis in childhood is a manifestation of hereditary syphilis. (b) It may be the only recognizable manifestation of the hereditary taint. (c) That prolonged constitutional treatment is necessary to obtain a satisfactory result, but that the result will be satisfactory if the treatment is thorough and prolonged. (d) That constitutional treatment by mercury is not only well borne, but the general health is improved by it. (e) That the second eye may begin to have an attack, and even a severe one, in spite of the fact that the system has been for months under the influence of mercury which has indeed caused the recovery of the eye first attacked and which will, if persevered in cause the recovery of the second eye also.

He cites as an example a case of a girl fourteen years old, with left cornea having the appearance of ground glass with

numerous densely opaque spots. The eye was also deeply injected and the iris discolored. Atropine was used until the iritic symptoms disappeared. Three grains of gray powder were given twice a day, and the treatment kept up for sixteen months. The general health gradually improved and the cornea gradually cleared until at the end of 16 months, it was perfectly clear, and the vision 6-6. The gray powder was then discontinued. About two weeks afterward the patient returned complaining of the other eye. Pericorneal infection was found and threatening interstitial keratitis. Gray powder was again ordered, and the author feels sure that in a few months that cornea will also be clear. This patient had no other symptom of hereditary syphilis.

Case of Primary Carcinoma of Lacrimal Gland; Extirpation of Growth by Krönlein's Operation.

Buller, Dr. Frank and Byers, Dr. W. Gordon, (Montreal Medical Journal, October, 1900). The patient complained of bulging of the left eye and gradual failure of vision of that eye which was first noticed about ten weeks previous. There was no pain, but the parts to the outer and upper side of the eye were tender. He was well nourished, but very anemic. The vision in the other eye was normal. There was slight otosis of the left upper lid, and the veins of the conjunctiva were full and tortuous. The exophthalmos was very striking; there was a forward displacement of about 15 mm., and a downward displacement of about 5 mm.. The movements were normal, except outward. Just below the outer third of the superior margin of the orbit, between it and the eyeball, there was a dense elastic mass with nodular margin. This could be traced a short distance into the orbit.

The tumor was removed by Kronlein's method, that is, an osteoplastic resection is made and the piece of bone temporarily removed has the shape of a wedge, whose base is formed by the outer orbital margin, and whose apex ends in the anterior part of the inferior orbital fissure. When this has been chiseled out, the bony piece, together with the skin, fascia, and muscle flaps of the temporal region, can be so far turned outwards that entrance to the orbit in the lateral part appears free. After removal of the tumor, the skin and soft parts are replaced and held in place by sutures.

The patient was discharged in two weeks. There was a slight convergent strabismus, with limitation of movement outward. The growth proved to be an enlarged lacrimal gland, covered by a capsule. Microscopical examination showed carcinomatous tissue.

Glaucoma Absolutum; Extensive Subchoroidal Hemorrhage Following Iridectomy.

(Report from Pathological Laboratory of Royal Victoria Hospital.) The patient, 55 years of age, had two attacks of glaucoma, in the right eye. The last attack spoiled the sight entirely of the eye. On examination, the media were perfectly clear and the optic disc of a peculiar red and moderately cupped. T + 3.

Iridectomy was performed, and after the iris tissue was cut, the corneal wound gaped and the lens presented, it was removed, and some vitreous escaped. Fifteen minutes after the eye was bandaged the patient complained of great pain and intraocular hemorrhage was diagnosed. The globe was immediately removed.

On section the choroid could be seen protruding from the wound pushed forward by a large hemorrhage which everywhere extensively separated the vascular from the sclerotic coat of the eye.

Dangers which Lurk in the School Room.

Meany, Dr. William B., (Indian Medical Record, Vol. xix., No. 8). The author is of the opinion that by proper hygienic surroundings much can be done to preserve normal visual capability in school children.

For example, school buildings should be so located as to secure the best sanitary environment and light—the northern light when possible. The window space should be one-fourth of the floor space, and the windows single sash windows, and four feet from the floor. The curtains should be gray or buff in color, two to each window, and hung in the center, so that either the upper or lower half or both can be shaded. The desks and seats should be properly fitted to each pupil to prevent the crouching habit, which puts great strain upon the accommodating apparatus of the eye, causes compression of the superficial veins of the neck, congestion of the head, and may lead to myopia.

Blackboards should be placed opposite windows, not between them. They should be at least twenty feet from the nearest pupil, so that the rays of light from the objects on the board can be brought to a focus on the retina, with the minimum effort of the accommodation. All work placed upon the blackboard should have a certain minimum size, so that the area of each letter will correspond to the square of a visual angle of five minutes. A double column page is preferable to the same amount of matter extending in a single line across an entire page. No type should be smaller than 1-50 of an inch for work held 1 foot from the eyes, and for continuous reading, the type should be 1-16 of an inch. The

paper should be dead faced white paper, with non-reflecting surface.

Two Cases of Foreign Bodies In the Eye (of two days' and one month's duration respectively), Removal; No Ill Effects.

Mudaliar, Dr. V. Srinavasco, (Indian Medical Record). The first case was a boy who, while playing, had a handful of dust thrown into his face. A small piece of broomstick buried itself in the inner canthus of the right eye. The body was removed without any cocaine. It was one inch long and one-half an inch in circumference. A few drops of blood oozed out. Boric acid lotion was applied and no ill effects followed.

The second patient was a child who a month previous had stumbled and brushed the left eyeball against a maize stalk. There were a few drops of blood. The eye was neglected for one month, when it was very much swollen and contained much purulent mater. A yellow hair-like streak was observed at the external canthus. When removed this proved to be a chip of maize stalk $\frac{3}{4}$ of an inch long. Boric acid lotion was applied, and there were no ill effects.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

By ROBERT L. RANDOLPH, M. D.,

BALTIMORE, MD.

AND

CHARLES ZIMMERMAN, M. D.,

MILWAUKEE, WIS.

(QUARTER ENDING DECEMBER 31, 1900.)

A Novel Spectacle Frame.

Sarason, L., Dr., Berlin, (Berliner Klin. Woch., 1900, No. 35, p. 787). This frame does not allow myopic children to use their distance glasses for near work, as a simple mechanism removes them automatically from the visual line as soon as the head is bent downwards, for reading or writing. The upper periphery of the glasses is fastened to the upper rim loosely like a pendulum, which swings forward, when the head is inclined. An arrangement prevents disturbing oscillations, and a subsidiary arrangement permits of the fixation of the glasses for running, playing, etc. It is manufactured by Lucke and Andre at Rathenow, Germany. C. Z.

Contribution to the Extraction of Foreign Bodies from the Brain A Case of Successful Extraction of a Bullet Lodged in the Brain for Two and Two-Thirds Years.

Von Lewschin, L. L., Prof., Moskau, (Centralblatt f. Chirurgie, 1900, No. 34, p. 872). On May 7, 1897, K. B., aged 20, shot himself with a revolver, the bullet (Lefauchaux No. 9), passing through the glabella. He did not lose consciousness. Immediate total paralysis of limbs of left side. The wound healed in two weeks. Severe headache, which was persistent, and mostly in right occiput. Muscles and sensibility of face normal. After a year: Left pupil reacts sluggishly to light, right normal, as well as both on convergence, and fundus. V. L. = 1. Left sided hemianopia, apparently from injury of the radiation of Gratiolet. By Roentgen rays the bullet was located in the right (not left, as printed) occipital lobe 2.50 cm. from the inner table of the skull. March 21, 1900, extraction according to Doyen's method, after forma-

tion of a skin-bone-flap at right occipital region. The wound had healed by first intention on the eleventh day. Headache subsided and paralysis of limbs diminished. Nothing is said with regard to the hemianopia. The condition is illustrated by drawings. C. Z.

Injuries of the Eye by Lime.

Schmidt-Rimpler, H., Prof., Goettingen, (Berliner Klin. Woch., 1900, No. 36, p. 789). The recent observations of Andreae (reviewed by us in the April Number, 1900, p. 375), that the chief remedy for injuries of the eye by lime is the speedy and profuse irrigation with fresh water, instigated S. to investigations as to prophylaxis and treatment of affections of the eyes caused by lime. He also studied experimentally, in the physical laboratory of Prof. Riecke, the process of slaking lime and found the same results as Andreae, viz. : that at first the temperature rises slowly, and after 20° to 30 minutes to 70° and 100°. Therefore the injury by lime is not a combustion, but chiefly a cauterization. In 16 per cent, however, of his casuistics a combustion also occurred by hot exploding slaked lime. Two cases are described in detail. S. attributes the white opacity of the cornea after injuries by lime to the formation of albuminate of calcium, in accordance with Andreae. A few experiments on rabbits are reported to show the superiority of oil over water as a therapeutic measure. An equally sized piece of mortar (hydrate of calcium with sand) was introduced into each conjunctival sac of a rabbit, the left, however, covered with almond oil, and the eyes closed by sutures. After twenty-four hours conjunctivae of both eyes red and swollen. Corneae diffusely opaque, the right more than left. After twelve days a circumscribed marked opacity of right cornea, the left clear and normally reflecting. The right conjunctiva still red, left pale. S. considers only very copious irrigations with water effective, but prefers oil syringed into the eyes with a syringe containing 100 grams. He recommends the following procedures: 1. Speedy mechanical removal of lime particles with oiled or dry cotton, linen or gauze, if necessary with spoons, or forceps. 2. Syringing with almond or provence oil, and, if oil is not at hand, with water. For prevention he advises eye protectors of wire, as suggested by Andreae. C. Z.

The First Aid by Laymen in Injuries of the Eye by Lime or Mortar.

Stutzer, H. G., Dr., Coeln, Expert's opinion given to the Rheinisch Westphalische Baugewerks-Berufsgenossenschaft. (Deutsche Med. Woch., 1900, No. 37, p. 594). S. discusses

the questions, viz.: How do the observations of Andreae (reviewed in April number of *Annals*, p. 375), deviate from paragraph 21 of preventive measures of the above mentioned Building Association, and can the postulation of Andreae, to irrigate eyes, injured by lime, with water, be carried through and how? S. repeated the experiments of Andreae with the same results found by the latter. He endorses all suggestions made by Andreae to irrigate the eyes profusely with pure water. To simplify the method he advises not to use an irrigator which might not be understood by a laborer, but any vessel at hand, from which the water is poured in a thin stream from a height of one-half meter into the eye held open by a fellow laborer. As the chief point in such cases is that the lime should be removed as early as possible, all other procedures, as syringing with oil or glycerine, may cause unnecessary delay, while water is always to be had. The mechanical removal of particles of lime with oiled cloths cannot be entrusted to laymen, but has to be left to a physician. S. suggests the placing of charts at building sites with printed descriptions and illustrations of the necessary manipulations.

C. Z.

Disturbances of the Eye-Measure in Hemianopics.

Liepmann, H., Dr., Dalldorf, and Kalmus, E., Dr., Luebeck, (*Berliner Klin. Woch.*, 1900, No. 38, p. 838). The authors found that hemianopic patients, when asked to divide a vertical line into halves, could accomplish this correctly, while in dividing horizontal lines the half corresponding to the defective side, was too short in 81 per cent of the experiments. They offer the following explanation of the phenomenon: Our conception of distance is gained by ocular movements. The right-sided hemianopic, while fixing the center of the line, sees the left end indirectly and knows the impulse he must impart to his eye to fixate it directly. In doing this he has, at every moment, a control of the motion in the end which he sees. But he does not see the right end, he has to search for it, and does it by excessive uncontrollable movements. From the expended higher amount of work in looking to the right he will over-estimate the right half of the line and therefore shorten it in division to make it equal to the left half. Loss of sensibility impairs very much the motility of a limb. Visual perceptions play an analogous role in the motility of the eye. Therefore the loss of visual elements in the hemianopic retina impedes the motility of the eye in the corresponding direction, and from the impaired innervation results an over-estimation of the motion, and thus the corresponding half is cut too short. Generally speaking, the reason for the faulty division of a line lies in all cases in the de-

teriorated mechanism of the muscles, from loss of sensory regulations. The phenomenon, therefore, seems to support the empiristic theory of our conception of space. C. Z.

Investigations on Eye Magnets.

Turk, Siegmund, Dr., Berlin, (Berliner Klin. Woch., 1900, No. 41, p. 910). T. compared the strength of Haab's and Hirschberg's magnets by determining their attractive forces upon fragments of soft iron of the weight of 1, 5, 10, 20, 50, 100, 250 and 500 mgr. on direct touch or at distances of 2, 5, 10, 25, 40 and 50 mm., with the following method: The greatest weight was ascertained which the fragments, attracted by the magnet, could support at the distances mentioned, without being torn off, and recorded in a table. The attractive force grows less with lighter pieces of iron. Hirschberg's magnet is relatively not much inferior to Haab's, if fragments from 1 to 250 mgr. touch the magnet directly. The small magnet is more practical, if it can approach the iron as near as a few millimeters without injuring the vitreous. This is possible by corneal section with foreign bodies in anterior and posterior chambers, in iris or lens. For deeper ones the large magnet is indicated, as a rule, except if they are very small and tightly lodged. Then Hirschberg's method to introduce his magnet through the vitreous close to the fragment and extract it is better. In Haab's method the most powerful magnet is the most effectual and—if placed at the correct distance—the least dangerous, since the stronger a magnet, the more powerful is its action at greater distances, while the increase of its action for smaller distances grows relatively little. Thus the extraction can be performed at a greater distance, so that in the advance of the iron the attractive force at the end of the extraction exceeds least that at the commencement. C. Z.

Hemianopia and Its Localizing Diagnostic Value.

Salomonsohn, Dr. H., Berlin, (Deutsche Med. Woch., 1900, No. 42, p. 677). S. defines hemianopia as all defects of the visual field caused by lesion of the quadrant fascicles of the optic fibres; with regard to localization it must be called optic nerve-chiasm-tractus—or cerebral hemianopia. We know that the visual fibres of each quadrant of the retina, which is bordered by one of each halves of the horizontal and vertical meridians of the retina, run in a compact fascicle which, however, has no visible anatomical borders. The lesion of such a quadrant fascicle causes quadrant anopia. In the portion of the optic nerve, which contains the retinal vessels, the afterwards crossing fibres of the inner retinal quadrant, occupy as a transverse band the chief portion of the transverse sec-

tion of the nerve. The upper part corresponds to the upper, the lower to the lower quadrant, and the lateral half to the muscular fibres of each fascicle. The fascicles of the outer retinal quadrant are separated from each other, those of the upper laterodorsal, those of the lower lateroventral. Each of these (non-crossing) fascicles contains the macular fibres at its lateral margin, so that all macular fibres constitute a lateral section of the transverse section of the optic nerve. In the non-vascular portion of the optic nerve the fascicles of the temporal quadrant of the retina run closely together in the ventrolateral half, the macular fibres of all fascicles in the axis, the non-decussating fibres in the dorso-medial portion of the periphery of the transverse section. The pupillary fibres cross also partially in the chiasm, and branch off from the optic fibres to a median course before the external corpus geniculatum, so that only a lesion of the optic path distally from the latter, will produce hemianopic pupillary reaction, which is a most important symptom for the localization of lesions of the fascicles. But only the positive hemiopic pupillary reaction is of localizing value, from the lack of phenomenon no certain conclusions can be drawn. Monocular hemianopia has never been accepted before, but the arrangement of visual fibres in fascicles make it possible that it may be due to affections of the optic nerve, chiasm or tractus. Lately some cases were observed by Mauthner, Comsserant, Wilbrand, R. Schulz, Nieden.

S. describes a case of monocular-manifest temporal hemianopia with hemiopic pupillary reaction ending in amaurosis, while the other eye had only perception of light. In the sella turcica a cystadenoma of the size of a walnut was found, both optic nerves atrophic, chiasma pulled apart from above and behind, so that the distance between the optic nerves at the base amounted to 1.9 cm. The hemianopia must have been bitemporal on account of the stretching of the crossing fibres in the median line of the chiasm. The chiasm is the only point of the optic path, where one focus may produce total horizontal hemianopia.

A case of inferior hemianopia in a woman, aged thirty, is reported. Optic disks pale, peripheral specific chorioiditis, papillary atrophy of the base of the tongue. The defect surpasses symmetrically the horizontal line in the temporal halves of the visual field. The peripheral borders for colors normal, R. uncertain and changeable. Pupillary reaction in both preserved, directly and indirectly, even in the defective area. Repeated perimetric examinations revealed exactly the same borders in both temporal halves, while the latter constantly changed in the nasal, where relative scotomata sometimes.

increased to absolute ones, or almost disappeared. Despite injunctions V. impaired, so that it seemed as if total failure could not be averted. The diagnosis was syphilis. Apparently the syphilitic process affected simultaneously the cruciated quadrant fascicles in the chiasm from above, the non-cruciated only isolated.

A transient homonymous hemianopia was observed in a woman, aged fifty, two days after chloroform narcosis, but had subsided at an examination three weeks later. S. explains it by a slight superficial hemorrhage, caused by vomiting, or by a mass, amenable to absorption, at the occipital cortex in the region of the visual centre. C. Z.

On the Mechanism of Certain Cortical Visual Disturbances of the Dog.

Hitzig, Edward, Prof., Halle, from the Psychiatric Clinic of Halle, (Berliner Klin. Woch., 1900, No. 45, p. 1,001). H. proved by experiments that the cortical visual center of the dog, if he has any at all, is situated neither in the sigmoid gyrus nor in the place A. (in the occipital lobe, so called by H. Munk), since extirpation of the sigmoid gyrus was not followed by increased or repeated visual disturbances, after they had been created by extirpation of A. and again subsided. If these extirpations were performed in reversed order the remarkable result was observed that no visual disturbances set in. Surmising that the visual disturbance, if not caused directly by damaging the optic centers, as proven, results indirectly from temporary checking of the activity of such centers, H. tried to answer the question: Where does the checking set in, in the cortical or subcortical centers, by studying the relation of the optical reflexes to the visual disturbances, especially the reflex closure of the palpebral fissure on the approach of the hand. Experiments disclosed a complete independence of the perturbation of the optical reflexes from the visual disturbance. Operation on the motor area of the cortex regularly affected the optical lid reflex, operation on the second area left it intact, at least primarily. If injury of the sigmoid gyrus causes a considerable impairment of the optical reflexes of long duration, although the visual act was scarcely and only temporarily interfered with, this cannot be due to a checking of the activity of cortical optical centers, nor to that of motor cortical centers, since some dogs showed at first a marked hyperesthesia of the optical lid reflex after extirpation of the sigmoid gyrus, followed on the second day, by total abolition of this reflex. Thus the subcortical motor center remains as the only organ, which can be held responsible for the checking of the optical reflexes. From these observations H. explains the lack of temporary checking of the vis-

ual act after secondary operations by the following hypothesis: If one agrees that the optic and reflex disturbances after lesion of A. as well as of the sigmoid gyrus occur under simultaneous checking of the activity of the subcortical optical and motor centers, one must also concede that from these lesions changes from the subcortical centers result, perhaps by secondary degeneration, which must spread from one subcortical center to the other in such a fashion, that later irritations in the same paths, but in opposite direction, lose their influences upon those subcortical points of impact. C. Z.

Dissection of the Anterior Capsule of the Lens.

Blumenthal, Dr. L., Riga, (*Beitraege zur Augenheilkunde, Heft 45, p. 411*). According to B. extraction of the transparent lens, recommended by Sattler in high myopia and zonular cataract, must be reserved for large clinics, on account of the greater risk with regard to danger of infection, difficult delivery of the lens, prolapse of iris, increase of tension from swelling of the remaining lens matter, since, according to Sattler, only up to two-thirds of the whole lens can generally be removed, and more difficult after treatment. After discussing the methods of various authors the author described his own method practiced on twenty-three eyes for high myopia, zonular, traumatic and anterior polar cataract. He prefers Bowman's needle to the knife on account of the more speedy closure of the wound, and thus diminished danger of infection: Keratonyxis in upper temporal quadrant of right eye, in upper nasal of left, which is easier and more handy than in the lower quadrants. The capsule is opened by a crucial incision in the center and two vertical cuts, one near the temporal, the other near the nasal pupillary margin. During the operation, which is done with the stop speculum, the aqueous is allowed to escape freely. Thus a free opening of the capsule is secured, which is absolutely necessary according to the recent observations of many operators, as Hirschberg, Schnabel, etc. The bandage must not be applied too tight lest corneal abrasion might occur in very myopic eyes, which frequently are exophthalmic. First change of dressing after six hours, instillation of sterilized boric acid solution and atropine. The eye is dressed twice on the second day, and the other eye left free. From the third day no bandage. B. considers the so-called open treatment after eye operations as a risky experiment. Atropine is used moderately on account of the enlargement of the pupil, caused by swelling of lens matter. B. evacuates as much lens matter as possible by paracentesis and, if necessary, repeats it after six weeks. Thus the time of treatment is considerably shortened and secondary discission, with eventual opening of the hyaloid mem-

brane, is avoided, since no secondary thickening of the capsule is likely to occur. B. regards it as the chief point in the operation, that the vitreous remains intact. To evade increased tension, B. waits with the first paracentesis until the whole anterior chamber is filled with lens matter, but before the latter touches the posterior surface of the cornea, which almost surely will bring on an attack of acute glaucoma. Thirteen cases are reported in detail. C. Z.

Disturbances of Light-Sense and Erythropsia after Myopia Operations.

Osswald, Arthur, Winterthur, (from the eye clinic of Prof. Haab at Zurich), (*Beitraege zur Augenheilkunde*, Heft 45, p. 464). Several patients, including the author himself, who had been operated upon by Prof. Haab for high myopia, complained of diminution of sight under lessened illumination and erythropsia, while V. obtained by the operation in good light was better than before. On the suggestion of Haab the author tested the light-sense and related phenomena on himself and nine such patients with Foerster's photometer, the figures of which on the charts had to be modified for this purpose, and Seggel's test types (black letters on white and three different shades of grey cards). The clinical histories and examinations are fully reported with the following results: The minimum stimulus of light-sense was higher in the eye operated upon than in the other (by both methods). The light-sense of the unadapted aphakic eye was one-fourth of that of its fellow, after adaptation of fifteen minutes duration one-half of the latter, which shows that the aphakic eye recovers more slowly in darkness than the other. A comparison of the light-sense of a man operated on both eyes for senile cataract revealed only a slight increase of the minimum stimulus. The visual field of myopes is notoriously more limited than normal, and for the aphakic eye O. found it for white a little more contracted downwards than in the other eye, more so in all quadrants from blue to green, with even greater contraction with sinking illumination. Besides limitation downwards also a temporal contraction was noticeable, which in light surpassed the former only in green, in diminished light from red on. In the cataract patient the visual field was analogous, but absolutely larger. Myopia and hemeralopia not very rarely seem to occur simultaneously (Krienes, Wilbrand). The increase of the minimum stimulus in the aphakic eyes tested is characteristic of hemeralopia, but the perimetric contraction for blue, found regularly in hemeralopia by Krienes, did not occur in the former. The subjective sensations were those of hemeralopia, but not before the operation. Therefore O. sees an advantage in op-

erating only on one eye in myopia of both, so that the intact eye retains its normal light-sense unaltered. He adopts the explanation given by Fuchs, who attributes diminished light-sense in aphakia to the effect of glaring caused by greater expenditure of the visual substance in consequence of the now more freely entering short-waved rays. Thus the aphakic eye has less amount of visual substance, and its function is impaired under diminished illumination.

In undoubtedly causal connection with the diminution of light-sense in the aphakic myopic eye is the frequently observed phenomenon of erythropsia. The occurrence of erythropsia in healthy eyes, often experienced in traveling over snow fields on high mountains, points to the influence of light rich in short-waved, i. e., ultraviolet rays. This is supported by the frequency of erythropsia in aphakic eyes, which are not protected by the intense absorption of ultraviolet rays through the lens, as shown by Brucke, Wildmark and Schulek. The author observed also erythropsia in his whole visual field as far as $10-18^\circ$, in the temporal portion only $2-3^\circ$, which he could not explain. Of the many interpretations of erythropsia none is perfectly satisfactory, that of Fuchs, however, relatively still the best. F. assumes, that after intense bleaching the energetically regenerating visual purple is perceived entoptically. Fuchs admits, however, himself, that visual purple is very little influenced by ultraviolet light, while erythropsia occurs under the action of light abundant in ultraviolet rays. Therefore further investigations are required for the explanation of erythropsia. C. Z.

Three New Cases of Keratitis Aspergillina.

Gentilini, Dr. G., Operator at the eye clinic of Prof. E. Fuchs, Vienna, (Beitraege zur Augenheilkunde, Heft 45, p. 525). Since the first publication of Leber in 1879, who made the diagnosis from the bacteriological examination revealing the presence of *aspergillus fumigatus*, only seven cases have been described in literature. According to Uthoff two per cent of the cases of serpent ulcer are caused by *aspergillus*. The author, however, considers its occurrence very rare, since the records of clinic of Fuchs since 1894 showed only three cases, although each case of serpent ulcer or similar disease of the cornea was examined with microscope and cultures. These three cases are described; in all *aspergillus fumigatus* was found, which apparently entered the cornea after an injury (in one by the thorn of a chestnut). The *aspergillus* grows only under favorable conditions of temperature and nutrition on the cornea, and even experimentally cannot be cultivated very easily. Despite profuse lachrymation the ulcer is dry, whitish, its surface is rough and projects over the

surrounding cornea. Gradually an infiltration of the latter towards the periphery develops, but it is characteristic of this affection, that the opacity (the immigration ring) does not reach the ulcer, but stops about one mm. distant from it, so that the ulcer is surrounded by a ring of transparent cornea one mm. wide. The course is different from serpent ulcer, as the ulcerated portion of the cornea may slough in toto, in serpent ulcer only in small particles. After this separation (spontaneous or operative) the infiltrated ring clears up, and vessels course from the limbus through the formerly transparent ring to the scar. The treatment consists in atropine, scraping or cauterization of the focus, bandage and, if very painful, hot applications. C. Z.

A Thousand Cases of Myopia.

Schlesinger, Dr. Josef, Breslau, from the records of the practice of Prof. Hermann Cohn, Breslau, (*Beitrag zur Augenheilkunde*, Heft 45, p. 537). In this paper one-thousand myopes are considered of at least 6 D., who were under observation for years. Among 15,490 eye patients they formed 6.45 per cent, 593 men, 407 women, whereas in the polyclinic the women prevailed, on account of the nature of their work in the lower walks of life, and had higher degrees of myopia. The number of short-sighted eyes decreases with higher degrees of myopia. The latter are rarely found in childhood, so that the average age of the patient rises with the degree of myopia. Vision decreases the higher the myopia. 25.28 per cent of myopia 6-8 D., 38.34 per cent of M. 8-10 D. had V. one and one-half. Myopes with opacities of the cornea were not excluded from the statistics.

S. intends to prove the fallacy of the opinion of Tscherning, that functional myopia generally does not exceed 9 D., and is not a dangerous anomaly. The most common change of the fundus in myopia is the *conus posticus*, but it does not necessarily occur; it was missing in 5.29 per cent, with an average $V=0.52$. It is not a regular disease, and may be found in rare cases of emmetropia and hypermetropia; in myopia it is, as it were, an "epiphenomenon." The percentage of eyes with opacities of vitreous grows with the degree of myopia. High myopia is of essential moment in the formation of cataract. Detachment of the retina occurred in 4.4 per cent, and, except in two cases, was unilateral. The average refraction of these cases was -12 D. and the age 43.3 years, so that the author does not share the opinion of others that detachment of the retina is met with at advanced age, and in very high myopia. Disease of the macula lutea (in 9.2 per cent), are frequently found in M. 6-8 D., and more so in older persons. Very rarely detachment of the retina and affec-

tions of the macula were combined. The material was not such as to allow of certain conclusions as to other eye-diseases found in high myopia, as insufficiency of the internal recti, divergent and convergent strabismus, and spasm of accommodation. The statistics of the author demonstrated, that not only in high myopia, but also in the lesser degrees up to 10 D. deleterious complications are encountered, and not exceptionally as Tscherning maintains: Opacities of vitreous 6.32 per cent in M. 6-8 D., 5.93 per cent in M. 8-10 D.; opacities of lens 2.93 per cent in M. 6-8 D., 3.68 per cent in M. 8-10 D.; detachment of retina in M. up to 10 D. not much more rarely than in the degrees up to 15 D.; disease of the macula 2.31 per cent in M. 6-8 D., 4.29 per cent in M. 8-10 D. S. also opposes the statement of Tscherning, that the so-called functional myopia generally does not exceed 9 D.: 417 persons had M. 10 D., of whom the chief occupation of 151 consisted in near work, i. e., 62.9 per cent. Most of them must have had a predisposition to myopia, which was increased to over 9 D. by near work. In 133 cases heredity could be ascertained, in most of them from the father. Boys of myopic parents are more disposed to myopia than girls. C. Z.

Contribution to the Therapy of Detachment of the Retina.

Staerkle, Arnold, Gaiserwald, (Inaugural-Dissertation. From the eye clinic of Prof. C. Mellinger, Basel, 1900). After a historic examination on the theories and treatment of detachment of the retina, S. reports 23 successive cases, which, from 1894-1900, were treated with subconjunctival injections of NaCl. in 2 per cent, 4 per cent and 10 per cent solutions. From his observations the author reached the following conclusions: Subconjunctival injections of Na Cl. are harmless and painless and foster materially the resorption of pathologic products in the eye, in proportion to concentration. In detachment of the retina they act beneficially for some time—in three cases a lasting reapposition of the retina was observed—with improvement of V. and V. F. Their effect is best in recent partial detachment, least in old and total detachment. All intermediate forms show different results, according to age and extent. C. Z.

Ophthalmoplegic Migrane.

Paderstein, Rudolf, Berlin, (Inaug. Dissertation, Heidelberg). A man, aged twenty, from infancy suffered from attacks of migraine with nausea, ptialism, vomiting and paralysis of all branches of right oculomotor nerve, but of different intensity. The attacks regularly occurred at intervals of about four weeks, commenced with violent pain, vomiting and ptosis, and disappeared on the fourth day. On the fifth day

diplopia, which lasted only one day. In the intermission perfect orthophoria, but paresis of different intensity of the muscles supplied by the third, except levator of upper lid. Later the intervals grew somewhat longer, the attacks more intense. They were almost always preceded by constipation and initiated by feeling of heat and chills. The pain was so severe that loss of consciousness and delirium ensued. Previous to ptosis edema of the upper lid was observed.

A woman, aged, twenty, had attacks of migraine from infancy, later on complicated by paralysis of abducens and trochlearis nerves, which finally became stationary. The paralysis, however, occurred sporadically, not periodically with each attack. The polymorphy of localization, which renders an anatomical explanation difficult, excludes the assumption of an organic disorder. The affection may be rather due to a disturbance of circulation, which may lead to edema, from autointoxication (Strumpell), or to peripheral neuritis. Thus the migraine would be an independent phenomenon of intoxication. If complicated by paralysis of the facial nerve, an electric examination of the latter might decide whether it be due to peripheral neuritis or not. The author advocates the substitution of the term "periodic or recurrent paralysis" by "ophthalmoplegic migraine." It cannot be decided whether the latter is a form of common migraine or a disease of itself, since the etiology of either is not known. C. Z.

The Pupillary Reaction when the Eyes Converge and Accommodate and when a Constant Quantity of Light is Spread over Smaller and Greater Retinal Area.

Vervoordt, Dr. H., Leiden, (Archiv. f. Ophthalmologie, vol. 49), gives his conclusions from his careful experimental work as follows:

1. The pupillary reaction which is seen during the fixation of objects at varying distances is associated with convergence and not with accommodation.
2. Most other observers have held that accommodation forms the primary factor in this reaction, but they have not taken into account the change of convergence.
3. It does not matter over how large a retinal area the light is spread; provided the same quantity of light enters the eye, the reaction of the pupil is the same.
4. A change in the diameter of the pupil of 1-10 mm. is the extreme limit that can be appreciated.

(Abstr. The Keystone, November, 1900.)

Argentamin in Ophthalmology.

Daxenberger, Dr. F., Regensburg, (Wochenschrift f. Therapie und Hygiene des Auges, IV., No. 1). Daxenberger

used Argentamin in the last three years with universally favorable results in all kind of conjunctivitis, with considerable swelling and secretion, brushing a 5 to 10 per cent solution over the everted lids. For after-treatment it may be instilled in 3 per cent solution. Daxenberger found it especially valuable in blennorrhoea neonatorum, for which he considers it a specific. Two cases are reported. He also prefers it in 3 per cent solution as a prophylactic to Crede's method. Argentamin surpasses nitrate of silver (it is a combination of the latter with aethylen diamin) on account of its bactericidal action into the depth of the tissues with less irritation. It is also valuable in gonorrhoea, laryngitis, pharyngitis, chronic rhinitis, eczema and enteritis. C. Z.

Injury of the Eye From Lightning.

Brixa, Dr. Jos. (Klinische Monatsblätter f. Augenheilkunde, November, 1900). This was the case of a telegraph operator who was struck while on duty. The following eye symptoms were present. Marked photophobia. Redness and some swelling of the lids. The conjunctivae were considerably congested, and the congestion was pronounced around the corneal margin. The corneae were bright and apparently normal, though in the anterior chamber of the left eye there was a slight exudate. In both eyes there was iritis, and in both lenses there were fine striations. It was difficult to make out the fundus. These changes in the eyes were accompanied with intense pain. There was a paracentral scotoma in both eyes. When a better view of the fundus could be obtained small black specks were seen between the macular region and the optic nerve. This was the case in both eyes. The author attributes the changes in the eyes to two factors, first to the jar or concussion and in addition to this to the action of the heat. Both of these factors would cause disturbances in the circulatory condition of the eye. The effect of the heat was seen in the edema of the lids, and in the usual evidences of a burn, as, for instance, in singeing of the eyelashes, etc. In those parts of the eye free of blood vessels, as, for instance, in the cornea, and the lens, there was a clouding usually transient in the cornea, but permanent in the lens. The changes found in the fundi were interesting, and he seems in doubt as to their origin. R. L. R.

Detachment of the Choroid After Cataract Extraction.

Fuchs, Professor, of Vienna, (Archiv. f. Ophthalmologie, LI Band, 2 Heft). Knapp was the first, I believe (in 1868) to call attention to this subject. Since then less than a dozen cases have been put on record. Fuchs has observed in his clinic in the space of six months, no less than five cases of

detachment of the choroid. These five cases he reports in detail, and in addition three other cases in which the detachment occurred after iridectomy. The chief point which leads Fuchs to suspect the presence of either partial or complete choroidal detachment is either partial or complete obliteration of the anterior chamber coming on generally from three to eleven days, and even later after the cataract extraction. This is indeed the most important and interesting clinical point in his communication. The detachment was usually seen as a brownish black mass protruding into the vitreous. In most of his cases there was minus tension. He analyzes most of the cases in literature, and seems to think that the usual explanation for choroidal detachment is inadequate. He holds the opinion that a rent is produced at the insertion point of the ciliary body, and through this rent we have a communication between the aqueous chambers and the perichoroidal space. The aqueous passes through this tear or rent into the peri-choroidal space, at the same time forcing the choroid forward into the vitreous body. The aqueous now is beneath the choroid instead of in the anterior chamber. The consequent pressure upon the vitreous drives it forward, and in this way the lens and iris are forced forward and the anterior chamber is obliterated. He reports five cases, in two of which a rent was discernable at the root of the iris. This rent is supposed to have had its origin in the operation. It is rather surprising that in none of the cases did the patient fail to recover useful vision. One would infer from this communication that the prognosis in this class of cases was favorable.

R. L. R.

Case of Sudden Shrinkage of the Eye-ball after Use of the Giant Magnet.

J. Hirschberg and S. Ginsberg (Centralblatt f. Praktische Augenheilkunde, October, 1900). Hirschberg, after reminding us of the long series of good results which he has obtained with the Haab magnet, proceeds to report a case where a steel splinter had remained in the eye for three months, and where an unsuccessful attempt had been made by a colleague to remove it. The operation was performed on the day of the injury, and twelve weeks later the patient fell into Hirschberg's hands. The injured eye was at this time irritated, soft and sensitive to pressure, and evidently the seat of degenerative changes. There was a scar (from the operation) about 5 mm. long in the sclera, running downward and outward. The ophthalmoscope gave a dull red reflex. The patient could recognize the movements of the hand at two feet. The location of the particle of iron was determined accurately by the sideroscope, and by the X-rays. The first

trial was made with a Schlosser's magnet, but without success. The next trial was made with the Haab magnet, and the strength of twelve amperes was necessary to pull the body to a point in the anterior chamber, from which point it was removed by the aid of Hirschberg's small magnet. The splinter weighed 22 mg. Two days later the condition of the eye was very favorable, but later on cyclitis set in, and in two weeks the eye had shrunken and enucleation was found necessary. He thinks (in the light of this experience) that if the old operation wound had been enlarged and his small magnet introduced right into the vitreous body, that the outcome would have been different, and that the patient would have likely preserved some sight. Then follows a long account of the anatomical findings in the enucleated eye. R. L. R.

A Case of Double Refraction in an Eye the Result of Sclerosis of the Lens.

Guttman, Dr. Emil, (*Centralblatt f. Praktische Augenheilkunde*, October, 1900). Two years ago Guttman reported a case of double lenticular refraction caused through sclerosis of the lens. The second case was that of a man of sixty-two years of age, who had been a railroad conductor, and who had passed successfully the examination for that position. For some time he had been complaining of poor vision in the right eye. Objects seemed smeared over and indistinct, and a light looked like a white circle surrounded by a number of little flames. Examination with the ophthalmoscope and by skiascopy showed the case to be one in which there was a difference between the refraction of the center of the lens and that of the periphery. No treatment was instituted, though in this connection it may be said that the first case reported by Guttman was operated upon (after preliminary iridectomy), and that now with the help of cataract glasses the patient enjoys good vision in that eye.

The Pathology of Conjunctival Tumors.

Best, of Giessen, (*Klinische Monatsblätter f. Augenheilkunde*, August-September, 1900). The author gives us his views as a result of the histological study of three tumors which had been removed from the conjunctiva. One was a papilloma situated on the semilunar fold, one was a pinguecula located near the limbus of the conjunctiva and the third case was one of epithelioma of the conjunctiva situated about 3 mm. from the corneal limbus. He discusses the question as to whether these tumors can eventually become malignant. First, as regards the pinguecula. This variety of growth never assumes a malignant type. We usually see along with the pinguecula a marked infiltration of the subconjunctival

tissue, and also a proliferation of the epithelium, such as one sees in leg ulcers. A nearer approach to malignancy is seen, or rather represented, by the epithelioma. In the three cases on record there was a very close resemblance to the picture seen in epithelioma of the conjunctiva. The author finds it difficult, however, to separate the papillomata from that form of cancer in which the papillomatous formation is strongly marked. Among the tumors described as papillomata of the conjunctiva there is undoubtedly a class which is absolutely harmless, in spite of their tendency to recur. The points which speak for a benign papilloma are the following. The fact that the growth is quite often multiple in character speaks for its probable benign character, and then again its favorite seat is on the caruncular border of the lid and limbus corneae. The conjunctiva is usually the seat of a catarrhal inflammation, and finally the patients are most often young people. Best then gives the chief histological points of difference, the most important of which is the fact that in the variety just described the papillary proliferation or growth shows no tendency to extend into the depth of the tumor. R. L. R.

The Healing Process In Wounds of the Lens In Some of the Lower Animals, An Experimental Study.

Knapp, Dr. Paul, (*Zeitschrift f. Augenheilkunde*, October, 1900). Knapp's communication covers a long and very interesting study of the healing process in lens wounds in frogs, fish, birds, rabbits and goats. His experiments show that the lens of the rabbit is exceedingly resistant to the effects of wounds, and that this power is possessed in even higher degree by the lens of the frog, fish and goat. The chief reason for this great resistancy on the part of the lens in all these animals (rabbit included) lies in the fact that rapid closure of the wound in the anterior capsule takes place, and this is produced in the beginning by a deposit of fibrin, and later on by the proliferation of the capsular epithelium, leading to the so-called capsular scar. As regards the resisting powers of the cortical substance, Knapp found that the parts lying next to the nucleus were more resistant than the outlying parts. This was shown by the behavior of the lens when perforating wounds of the latter were made. While degenerative changes were always seen immediately under the anterior and posterior capsular wound these changes were rarely seen in the region of the nucleus. These areas of degeneration behave differently in different animals. In the case of the frog, the bird and the fish, these areas were generally filled up with epithelial cells from the capsule which had grown into them, so to speak, and which in the course of time, becoming larger, ultimately formed a remarkably transparent tissue. This

process, however, was never seen in the case of the rabbit, and to a very slight extent, in the case of the goat. Knapp regards this cell proliferation as a regenerative process, and somewhat analogous to the proliferation of the cells of the anterior capsule after cataract extraction in human beings. The formation of new lens fibres was only observed in the case of the frog, but this is explained by the fact that too little time elapsed in the case of the other animals, for such a growth to take place. Knapp thinks it remarkable that the capsular epithelium in the case of the rabbit and the goat is no stronger in proliferating capacity than that of the other animals, which he used in the experiments. As regards the behavior of the nucleus of the wound in this locality could rarely be found and traces of it had almost entirely disappeared these traces being generally represented by a faint streak. Areas of degeneration which lay in the region of the epithelium were always quickly filled with young nucleated-lens fibres. The healing of the posterior capsule was always complicated by a proliferation of the epithelium from the equator. These latter points have been touched upon in the investigations of Gonin, Randolph and others. In two cases he obtained lenticonus posterior. In these two cases it was observed that the lens substance forced itself out of the wound in the posterior capsule, and pushed itself out into the vitreous body, presenting the appearance of a balloon. There was a noticeable absence of degenerative changes in this formation, and as a result of the latter, there was formed a lenticonus which was covered with white scar tissue.

These two cases vindicate the views of Hess in this connection that lenticonus can follow the rupture of the posterior capsule.

R. L. R.

The Occurrence of the Demodex Folliculorum in the Lid and Its Relation to Diseases of the Lid.

Hunsche, Dr. Karl, Kiel, (Munch. Med. Wochenschrift 6 November, 1900). The author endeavors to show whether this parasite, which is so frequently found on the lid, can cause a disease of the lid, whether in other words it is a pathogenic parasite and as such can be treated. He examines the normal eyelids (of the cadaver) in 116 cases. The eye lids were always apparently normal. He pulled out ten cilia in every case, and in eighty-six cases he found after careful examination the parasite. The author thinks that if the parasite can be found in so few as ten cilia in 116 cases, that probably the parasite would be discovered in every eye lid were every cilium examined. His conclusions are as follows: That this parasite occurs so often in the human eye lid it cannot be regarded as alone capable of causing disease. He denies the

existence of any such affection as conjunctivitis acarica. He finds the parasite in sections, and also on the cilia. He found that the parasite is brought out in the sections by the double hematoxylin-eosin stain. This is contrary to the observations of others. As to the position of the parasite he gives us no very definite data. Generally the head is directed inward. They are rarely found in the meibomian gland, but usually in the hair bulbs. The location of the animal is, as a rule, superficial. The author from these very exhaustive and interesting observations feels justified in concluding that the parasite has no pathological significance. R. L. R.

Blepharo-Sphincterectomy; An Operation for the Cure of Trachomatous and Scrofulous Keratitis.

Mulder, Prof. M. E., (Klinische Monatsblätter f. Augenheilkunde, November, 1900). Mulder has been practicing this operation successfully for the past eighteen years. The operation consists in the removal of some of the subcutaneous fibres which pass over on the tarsus of the upper lid. The purpose of this procedure is first to lessen the pressure of the upper lid upon the cornea in all cases where the corneal trouble is apparently kept up or aggravated through heightened contraction or spasm of the orbicularis, a condition very common in trachomatous and scrofulous keratitis. The operation is also designed to relieve the ptosis and thereby to free the cornea from its constant contact with the diseased conjunctiva. He has found that the operation invariably relieved the ptosis, and the abnormal pressure exercised upon the eyeball, and as a consequence, the patient suffers less, and it is possible to treat the conjunctival trouble more successfully. In most cases keratitis is warded off, and an already existing keratitis gets well easier. Relapses are comparatively seldom. When this operation is performed early we have an excellent safeguard against the occurrence of entropion. The operation is done under cocain anesthesia. An incision is made the entire length of the lid, and about 2 mm. above the lid border. By means of a second incision a small oval flap of skin 2—4 mm. broad, is removed, and with it all the underlying muscle fibres. One will often find these fibres well developed. The wound is then closed with two or three sutures, and a bandage applied and kept on for a few days, when the sutures are removed. R. L. R.

Metastases into the Joints after Ophthalmia Neonatorum.

Paulsen, Dr. J., (Munch. Med. Wochenschrift, 28 August, 1900). Observations relating to the occurrence of metastases into the joints after gonorrhoeal ophthalmia have multiplied considerably during the past few years, but usually the

primary infection has had its seat in the genitalia. There are few cases recorded where the metastasis has followed ophthalmia neonatorum. Paulsen reports a case of this character. On the third day after birth the child developed a blenorrhoea of the conjunctiva. This yielded easily to the usual treatment. Fourteen days later the left knee swelled up and soon afterward the right knee. Both knees were operated upon, and they were found to contain considerable exudate, and the exudate was found to contain gonococci unmixed with any other organisms. It may be said that the constitutional symptoms were much less marked than one would be apt to expect, and this Paulsen attributes to the fact that there were no other organisms present in the joints. The child made a good recovery. Metastasis into the joints after gonorrhoeal ophthalmia in the adult is not such an infrequent occurrence, but as I have said, we have usually a history of gonorrhoea of the genitalia. An occurrence of this kind would not be so unusual or so interesting as where the primary trouble were in the conjunctiva. It might be well then for ophthalmologists to make systematic examination of the joints in cases of ophthalmia, for it is quite possible for an infection in this locality to exist, and to disappear without having attracted attention. It might be well to note the fact, too, that the eye trouble yielded quickly to treatment, so that opportunity for a general infection would not be as good as where the disease lingered unusually long, and where we might expect just such a complication as that reported by Paulsen.

R. L. R.

Filtration through Fresh Animal Tissue.

Koster, Prof. W., Gzn. of Leiden, (*Archiv. f. Ophthalmologie*, LI Band, 2 Heft). It will be remembered, perhaps, that this author several years ago discussed the question of the possibility of filtration through the fresh iris and choroid, and that he concluded that such filtration was impossible. His recent experiments are on the same line, and his conclusions are as follows: The lymph which is secreted by the ciliary body (and perhaps in slight degree by the iris, choroid and retina) can, by means of pressure and current leave the inside of the eye only through the pupil and optic nerve. The property of filtration does not belong to the uvea. Under the same conditions (i. e., under pressure) lymph can neither pass within the lens capsule nor can it leave the same. The lymph which is secreted between the choroid and sclera can only leave the eye along the optic nerve, and the sheaths of the vessels which perforate the sclera. The sclera possesses no filtration properties. There is no movement of fluid in the corneal tissue under pressure and current, and like the

sclera and uvea the cornea is devoid of filtration properties. It seems from these experiments then, that the nutrition of the eye is carried on by osmosis, and that the same action is seen in the carrying off of the metabolic products.

R. L. R.

The Effect of Illuminating Gas upon the Visual Organ.

Dr. Purtscher, (Centralblatt f. Praktische Augenheilkunde, August, 1900). The author gives an historical survey of his subject, and calls attention to the following symptoms, which have been observed by others. In three cases exophthalmos was noted, probably due to loss of tone of the recti. In three cases there was strabismus of paralytic nature, and in three cases there was paralysis of accommodation. In four cases the pupil was narrow and twice it was dilated. In one case there was a paradoxical pupillary action. In one case there was impairment of central vision. In three cases there was narrowing of the peripheral visual field. In three cases venous engorgement was noted, and in one case there was great narrowing of the arteries, and in the latter case there was seen somewhat later on great paleness of the temporal half of the papilla, and in one case herpes zoster was a sequence. Of all these symptoms the most important, of course, are the impairment of central vision, narrowing of the field, and the muscular disturbances. His summary of the eye symptoms is taken from an analysis of cases reported by Simeon Snell, Nieden and others. To these he adds one which came under his own observation and the principal eye symptoms of which were a double sided (towards the left perfect, and towards the right imperfect) homonymous hemianopsia, normal vision and practically normal color sense. He thinks that the eye trouble must be attributed to hemorrhages in the cerebral cortex.

R. L. R.

Extensive Retinal Detachment from Explosion of a Mortar.

Bock, Dr. Emil, Laibach, (Centralblatt f. Praktische Augenheilkunde, August-September, 1900). Bock's case is a very remarkable one. The patient was a man of twenty-two who had fared badly in an explosion. His face was covered with particles of gun powder, and was the seat of several deep wounds, notably of the upper lid. Panophthalmitis destroyed the right eye. Ophthalmoscopic examination revealed wide-spread detachment of the retina and entire absence of the red reflex. Light perception gone. A month later he was discharged with a little more than light perception left, and with a clear round pupil and minus tension. At this time he had to be led about. Two months after this he came alone and reported that he could see to get about the city.

The picture was still that of extensive retinal detachment, and it was impossible to get anywhere a red reflex, yet the patient could count in three feet. He had had no treatment. When last seen, nearly eight months after the accident, he could count fingers in five metres. Bock gives no satisfactory explanation for the clinical phenomena present in this case. R. L. R.

The Pathology of Serpent Ulcer of the Cornea.

Dotsch, Dr. A., of the Jena Eye Clinic (*Die Ophthalmologische Klinik*, 5 October, 1900). This is a very interesting and important communication and contains a complete analysis of the cases of serpent ulcer seen in the Jena eye clinic during the years '98 and '99. The number of cases seen was ninety-eight. I think the chief point of interest lies in the results of the careful bacteriological examinations which were made in most of these cases. He has been able to confirm absolutely the conclusions of Uhthoff and Axenfeld, who, as we know, found in the majority of their cases the Frankel-Weichselbaum diplococcus in other words the pneumococcus. In sixty-three cases the pneumococcus was found forty-one times and in thirty-five of these cases in pure culture. The history of an injury was noted in sixty-nine cases. Inasmuch as this organism flourishes exceptionally outside of the human body it is doubtful whether it was introduced into the eye on the foreign body, but that the eye was subsequently infected by this organism, which we know, is not infrequently found in the mucus membrane adjacent to the eye. It would seem, then, that pneumococcus ulcer is the proper designation for this variety of corneal trouble. R. L. R.

The Operative Treatment of Pulsating Exophthalmos.

Golowin, Dr. S. S., (*Zeitschrift f. Augenheilkunde*, September, 1900). Golowin gives us a comprehensive communication upon this subject. He first describes the clinical varieties of this affection, and then speaks of the treatment, first of ligation of the carotid, and then of the orbital operations in these cases. He reports two cases where operative measures were resorted to, and in both he was successful. His conclusions are as follows: In every case the operative treatment of pulsating exophthalmos, must be individualized according to the clinical form of the affection. In those cases where marked brain symptoms are present, as, for instance, vertigo, distressing subjective noises, etc., one must by all means ligate the common carotid. In those cases where the clinical symptoms are confined to either the orbit alone or to the orbit and face together, it is better to perform an orbital operation. It is probable that in some cases one would get a good result

by ligating the ophthalmic vein, making the incision under the eyebrows. The ligation of the ophthalmic vein with a previous resection of the orbital wall will be found generally useful in those cases where relapses have occurred or where ligation of the carotid has failed. In such cases, indeed, this operation should be given the preference to ligating the common carotid of the opposite side since this latter is apt to excite too great disturbance in the cerebral circulation. Resection of the orbital wall must always be performed whenever the clinical picture of the pulsating exophthalmos suggests the possibility of an intraorbital growth.

R. L. R.

Atrabillin.

Wolffberg, Dr. of Breslau, (Wochenschrift f. Ther. und Hygiene des Auges, den 13, December, 1900). It will be remembered that this author has made other communications upon the subject of the suprarenal preparations, and a little over a year ago he published his report on atrabillin. More recently, experiments have shown that freshly prepared atrabillin in well corked bottles is absolutely sterile. After a bottle is once opened contamination can occur, but in order to keep the preparation sterile, in spite of this, the addition of a small quantity of either boric acid or sublimate, or formalin will be all that is necessary. These are his conclusions. From thirty to sixty seconds after the first instillation marked blanching of the entire conjunctiva will be noticed, and this is more marked in the case of normal eyes. This phenomenon, however, is quite noticeable in the case of eyes affected with trachomatous pannus. The pupil is unaffected. The agent certainly produces no mydriasis, but rather a suspicion of myosis. The drug may be said to help the action of not only cocaine and atropine, upon the pupil, but also of pilocarpine and eserine, and all observers agree that it produces no elevation of intraocular tension. The suprarenal preparations have a tendency to lower intraocular tension. There is a lessening of the secretion of tears. The agent possesses no anesthetic properties. It produces a very marked cosmetic effect in that it removes all reddened areas and contributes to the lustre of the eye, and at the same time produces a slight widening of the lids. Wolffberg is not prepared to speak much of its possible value in operations, though he mentions the fact that Zimmermann has used it with advantage in lid operations.

R. L. R.

The Emigration of India Ink from the Site of a Tattooed Leucoma.

Steiner, Dr. L., of Java, (Centralblatt f. Prak. Augenheilk, September, 1900). We all know that the black color of a ta-

tooed leucoma often fades in the course of time. Apparently a small portion of the ink finds its way out of the tissues entirely, but in the cases reported by Steiner, the ink remained in the cornea, and simply left the region of the scar. The author reports two cases with large and very white corneal scars. In the first case he succeeded in practically obliterating the scar, but four weeks later, when he saw the patient the leucoma was as white as ever, with the exception of several little black points here and there. The ink, however, had not left the cornea, for it was found in little streaks and spots around the leucoma. The second case was equally successful, as far as the operation was concerned, but five months later the leucoma was almost as white as ever, and the ink was found arranged in various shapes in the neighborhood of the leucoma. He refers to a case in which he had an opportunity of examining an eye which had been enucleated, and which at one time had been tattooed. The latter operation had been very successful, and the whitish color of the scar had never reappeared. He examined sections of the cornea and failed to find the clumps of pigment arranged as one would suppose, in the channels made by the needles, but spread all about in the scar, partly in the shape of little grains and partly as little clumps of different sizes and shapes. The smaller grains were found generally in the corneal corpuscles, and their prolongations, and sometimes even in the round cells of the scar tissue. The larger masses were found in the small blood vessels of the leucoma, and in the region of the latter. The coloration was confined to the anterior of the corneal thickness, and there was no trace of it in the epithelial layer.

R. L. R.

The Pathogenesis of Choked Disc.

Merz, Dr. A., of St. Petersburg, (Archiv. f. Augenhilfskunde, XLI Band, S. 325-355). The experiments were performed for the most part on dogs and rabbits. His conclusions are as follows: 1. Elevated intracranial pressure can by itself cause choked disc, but it is necessary for this pressure to be kept up uninterruptedly for a certain length of time. 2. Periodic or transient elevations of intracranial pressure will only tend to produce venous hyperaemia. 3. Choked disc can be produced by a very slight elevation in intracranial pressure, and the higher the pressure the more rapidly will the fundus changes show themselves. 4. The eyes of these two animals do not act alike, for while it is comparatively easy to produce choked disc in the dog, in the case of the rabbit the well known deep excavation of the disc in a measure nullifies the effect of the experiment. This may explain why those who have engaged in experiments of this character

obtained such widely differing results. 5. The first ophthalmoscopic change consists in dilatation of the veins, which is slowly followed by a narrowing of the latter. 6. The nearer the eye the blood-vessels pass through the sheath of the nerve, the more quickly we will get the vascular changes. 7. There are several factors which play an important role in the production of choked disc and not the least of these is the condition of the venous sinuses, the circulation in which is more or less interfered with by the increased intracranial pressure. Then again we have a stasis of the fluid in the subvaginal space, and a compression of the vessels from the point where they pass through the nerve sheaths all the way up to the intraocular end of the nerve. 8. We have, too, a compression of the nerve itself, and as a result, a disturbance in the lymph circulation, and it is just at this point we will begin to notice the edema of the nerve head, and the other changes. The author thinks the resemblance of the dog's eye is so close to the human that his experiments may be regarded as indicating pretty surely what takes place in choked disc in human beings. He gives a detailed account of his technique, which, in short, consisted in the injection into the skull of salt solutions. R. L. R.

The Influence of the Various Trades upon the Eyes.

Dr. Walther, of Charlottenburg, (Archiv. f. Augenheilkunde, XLII Band, S. 15-46). The investigations in which Walther engaged covered an examination of 2,672 workers in the various mechanical occupations. Among these he found 611 with more or less defective sight. Of these in 387 the trouble was congenital, and in 224 the affection was acquired. In 95 the occupation was regarded as responsible for the defective sight. There were 775 under twenty-three years of age, and of these 125 had defective sight. In 109 the defect was congenital, and in 26 acquired the vocation being responsible in probably 11 cases. In the case then of the young workers the congenital weak vision outweighed the acquired, and among this class of workers two only (8.1 per cent), were made weak-sighted by the vocation, but with advancing years this percentage increases. The class of workers included weavers, typesetters, cabinet makers, in fact, all the various kinds of mechanical occupations, and it seems clear that there must be in all these occupations—in some more than in others—conditions which are injurious to eyesight. R. L. R.

Cataract Removal in Persons with but One Eye.

Fritz Mendel (Berliner Klinische Wochenschrift, June 1, 1900). States that in the past eight years nine patients have come to Hirschberg's clinic who had lost an eye by an opera-

tion for cataract in the other eye. The unfortunate results of the first operation make the success of a second operation extremely important. A thorough aseptic preparation is the chief condition of success. The tear apparatus is a common source of infection, and if any inflammatory condition exists it must be thoroughly treated. The thorough antiseptic treatment of the nose for some time before the operation is also advised. In addition to this the lids must be thoroughly prepared. General anesthesia permits of much more thorough asepsis, and is advised in these cases. Preliminary iridectomy is also advised, and the operation for cataract is undertaken three weeks later. All of the nine cases were operated upon with success.—American Journal of Ophthalmology.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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(QUARTER ENDING DECEMBER 31, 1900.)

A Contribution to the Study of the Diagnosis and Treatment of Intraocular Magnetic Foreign Bodies.

Coppez and Gunzburg, Brussels, (Archives d'Ophtalmologie, September, 1900). This paper presents a review and summary of forty-one cases of foreign body in the eyeball treated in Coppez' clinic since the year 1892. Of these, eight were lodged in the anterior and thirty-three in the posterior portion of the globe. Of the first eight, two were located immediately back of the iris, five in the crystalline lens and one behind the lens. All of the bodies were comparatively light in weight, none weighing more than thirty-six milligrammes. The results of all these cases were fairly satisfactory, the best recovering with a corrected vision of one-half of normal; the worst having the ability to see to count fingers at one metre's distance. Traumatic cataracts as far as noted, were the rule; they being either absorbed or removed.

Of the thirty-three cases of foreign body in the posterior portion of the globe, the foreign material was not removed. In twenty-eight cases the results were as follows: One recovered with a vision of two-thirds of normal; two recovered with good light-perception; in five there was mere conservation of the organ. Seven enucleations were performed after unsuccessful attempts had been made to extract the foreign body. Sympathetic ophthalmitis, followed an attempt at extraction necessitating enucleation. In twelve cases, the operator proceeded at once to radical interference. Prognosis was found to be much more favorable if the foreign body was situated in the vitreous humor than if it was located in the

ciliary body or in the choroid. This was found to be partly due to the firm adhesions between the foreign mass and the ciliary body and choroid. In eight instances in which the eyeball was saved, the foreign material was extracted twice through a scleral wound of entrance which had been enlarged as required; and once through the cornea, following the removal of a traumatic cataract. In five cases, Hirschberg's method was employed. The authors believe that Hirschberg's method appears to be the plan of choice, unless, however, special indications for some other procedure should appear. In those cases in which the eyeball was removed after an unsuccessful attempt had been made to remove the foreign body the mass was found five times in the ciliary body, and but twice in the vitreous humor. Out of this group, the size of the foreign bodies necessitated four of the enucleations. Twice, owing to the time elapsing between the accident and the operation, adhesions had formed; and once, the method of introduction of the magnet through the scleral wound may have been wrong; and thirdly, the flat shape of the foreign body itself must be considered.

Of ten cases in which enucleation was performed without any attempt being made to save the eye, five were removed on account of violent inflammatory or infective symptoms, two suffered from sympathetic ophthalmitis, and three were subject to attacks of inflammation following long periods of quiescence.

In several cases, the foreign body was not removed, and once at the request of the patient, the operation was postponed. In three instances, the eyes failed to present any danger signals after a considerable period of time had elapsed after the accident; the patient being kept under observation. One patient with but one eye was seen too late, at which time it had become impossible to remove the body.

Siderosis, they state, almost always follows, if a magnetic foreign body remains in the eye, even for more than a year's time; statistics showing that this happened in five out of seven times. One case evidenced slight siderosis around the body after a period of thirty-two years, and in the seventh instance, in which the organ was atrophied and in which there was ossification of the choroid, there was a doubtful siderosis.

Twenty-three of the patients with foreign bodies in the posterior portion of the globe were seen during the secondary stage. The results obtained in these cases show that at a given period the heavier the foreign body the graver seemed the prognosis. As a result, the authors found twenty-nine per cent of the cases with a degree of vision that varied from light-perception to two-thirds of normal; with, in some of the

cases, a possibility of further improvement from operations. In fourteen per cent the eyeball was saved, but without vision. Enucleation was done in fifty-seven per cent. Great value is placed upon the almost invariably accurate results in diagnosis that were obtained by Gerard's magnetometer; without which instrument many of the results would have been impossible.

On The Action of Suprarenal Extract.

Zimmerman, Stuttgart, (La Clinique Ophthalmologique, October 10, 1900). Fresh solutions of dried suprarenal glands Zimmerman states, may be introduced into the conjunctival cul-de-sac without producing any irritation. He has found that the conjunctival vessels contract and disappear from view first, but if the action of the material be continued sufficiently long, the scleral vessels will do the same. This, he says, renders the drug of considerable service in inflammatory and congestive disturbances of the ocular structures. He has found that probably the most marked therapeutic action which may be noticed, is the ability of gland material to quiet certain intractable cases of glaucoma, particularly if it be used in connection with weak solutions of some of the older miotics. Darier's formula, which contains three centigrammes of chlorohydrate of pilocarpine and two centigrammes of salicylate of eserine to ten grammes of an equal part solution of dried suprarenal glands in water have given him the best results.

Toxic Optic Neuritis.

Sourdille, Nantes, (La Clinique Ophthalmologique, October 10, 1900). It has been Sourdille's good fortune to obtain two very interesting specimens, one showing the early changes in acute, and the other the late manifestations in chronic optic neuritis. The first was obtained from a man who suffered from an orbital phlegmon, which destroyed the sight. The ophthalmoscope showed the picture of typical optic neuritis. The eye was enucleated.

A considerable portion of the optic nerve was removed and prepared for microscopic examination. Slides made from portions of the nerve about three to four millimeters back of the sclerotic coat showed that the connective tissue sheaths were almost entirely emptied of their nervous and neuroglial fibres, these being represented by scattered particles of tissue. The retinal artery and corresponding vein were obliterated by endarteritis and phlebitis. Numerous streptococci were found in what had been the lumen of the vessels. One or two millimetres further back the conditions were somewhat changed. In this situation, the predominant features

consisted of an intense leucocytic infiltration with an extreme development of the connective tissue septa and a relative conservation of the nervous bundles.

The second specimen was obtained from a syphilitic and tuberculous woman who was a confirmed alcoholic.

An ophthalmoscopic examination, practiced while the patient was in extremis showed a marked atrophic decoloration of the temporal half of the optic nerve heads. The autopsy gave evidence to an axial optic atrophy. Section of the canalicular portion of the optic nerve demonstrated the presence of degeneration of the central half of the nerve. The peripheral portions were normal. This atrophy reappeared in the cerebral portions of the nerve, but could not be found in the optic chiasm. In the medio-orbital section of the nerve the degenerated fibres divided into two parts, though still remaining central. At fifteen millimeters back of the eyeball, before the penetration of the axial vessels, the nerve appeared to be in a healthy condition. The most striking lesion was found in the endothelial layer of the walls of smaller arteries and the associated capillaries. The walls of the membrane were thickened, hyaline in character, and contained an increased number of nuclei. The swelling was so great that in places the lumen of the vessels was obliterated. This condition of endarteritis obliterans seemed to be the primal lesion. The condition was not found in the central artery of the retina. The neuroglia of the diseased sections was thickened and sclerosed, while the cylinder axes were lost.

From a study of the two cases, the author draws the conclusion that the acute form consists in optic atrophy which is due to the direct action of the poison on the nerve tissue, whereas the chronic form is secondary to an endarteritis. The locations of the lesions point, he believes, to this conclusion. In support, he says, in the first case the most marked degeneration was found in a portion of the nerve that was richly supplied with blood vessels, while the second was in a part which was but poorly supplied by recurrent arterioles from the central artery.

The Extraocular Complications of Sympathetic Ophthalmia.

Rogman, Grand., (*La Clinique Ophtalmologique*, October 25, 1900). In February, 1899 Rogman removed a cataract from the left eye of a man fifty-nine years of age by the combined method. At the end of two weeks' time, the wound had healed and the eye was quiet. There were, however, a few fibres of the iris caught in the wound. A fortnight later, the eye operated upon became irritated. The aqueous humor was cloudy and there was a diminution of visual acuity. Despite energetic treatment, the intraocular infection increased and was followed by a sympathetic uveitis.

This ran a course of alternating improvement and aggravation. In about three months' time after the performance of the operation, the patient became suddenly deaf. This condition was not attended by any pain. There were not any apoplectiform manifestations: Neither was there any lesion of the external or the middle ear. The patient remained blind and deaf until the date of his death, which was caused by uremia.

The author attributes the loss of hearing to an inflammatory process starting at the base of the cranium and extending along the auditory nerves until it possibly reached the labyrinth.

The Treatment of Tabetic Atrophy of the Optic Nerve.

Demicheri, Montevideo, (La Clinique Ophthalmologique, October 25, 1900). The results obtained by Demicheri from the use of mercury in the treatment of tabes, are in line with those of de Wecker, and lead him to the conclusion that the use of this drug is dangerous in such cases. Recently he has been employing nitrite of sodium with fairly encouraging results as far as the ocular symptoms are concerned. In all the cases which he reports, there was an improvement in vision and an increase in the visual field. Five days per week he injected one gramme of a six per cent solution of the drug subcutaneously, and every other day he injected five or ten drops of the same solution beneath the conjunctiva. In the one case, the subconjunctival injections alone were used, the result being as good as that which was obtained by the combined method. As a rule, he says, the patient notices an amelioration of his condition after five or six injections have been administered, the maximum result being obtained at about the end of two months' time.

Researches Into the Mechanism of the Pupillary Movements.

Angelucci, Palermo, (Revue Generale d'Ophthalmologie, 31st, October, 1900). Angelucci believes that the relaxation of the muscular fibres of the iris (that is, dilatation of the pupil), is due to the functional arrest of the vaso-constrictor system of neurones; this relaxation, therefore, of the muscular elements being passive, in accordance with the direct nervous action. Nevertheless, he says, an active relaxation of the smooth fibres of the iris may be produced by assimilative or anabolic processes that are able to bring about this condition.

A Comparison Between the Removal of a Portion of the Anterior Capsule During the Operation of Extraction with other Operative Procedures.

Terson, Sr., Toulouse, (Annales d'Oculistique, October 1900). Secondary cataracts Terson says are formed princi-

pally from the anterior capsule. Removal of part of this during the extraction will, in a large number of cases, prevent the necessity of a secondary operation. The chief inconvenience of the method is that it necessitates the combined method of operation. One precaution is necessary; and that is to determine the thickness of the capsule before operating. This can be done by examining the membrane with oblique illumination. If the surface is smooth and exhibits its normal color, it may be seized with the forceps during the procedure, and a portion carefully withdrawn. If the surface, on the contrary shows markings and opacities, a cystitome must first be introduced, and the capsule lacerated in the lower part of the dilated pupil at the level of and slightly in front of the spot showing the markings. In cases of the first variety, the author supplements the use of the forceps by cutting into the edges of the capsular remains with a cystitome in order to encourage their further retraction.

In addition, the advantage of but one operation instead of two for the removal of the capsule allows the aqueous humor to circulate much more freely throughout the anterior and posterior chambers, thus tending to lessen the danger of post-operative infection.

On the Early Perforation of the Membrane of Descemet.

Petit, P., Rouen, (*Annales d'Oculistique*, October, 1900). In this case there was an ulcer which was said to be the result of an unprotected condition of the cornea that was exposed by reason of the removal of a large portion of both the upper and the lower lids for the radical cure of a chancroid. The ulcer spread so rapidly that enucleation became necessary. This was performed three days after infection. The corneal tissue proper was destroyed to a depth of about one-third of its thickness. The membrane of Descemet was intact, although its endothelium was destroyed in some places and massed together in others. Bacteriologic examination was unsatisfactory. The only kind of staining that proved successful was that of Loeffler's. This method revealed the presence of large coccobacilli, which were grouped in twos; though any attempt at identification was impossible. The author reviews the literature bearing upon the subject and concludes that:

1. Certain cases which have been freshly cited concerning the early perforation of the membrane of Descemet are not above criticism, and should, at least, be considered as doubtful ones in which it is difficult to assert whether there had been a true or a false perforation. (As shown by some of the illustrations of Petit's article a fold in the cornea produced by the reagents employed may hide the membrane of

Descemet to such an extent that only the most careful focusing will reveal its presence); and examples of certain cases which have been reported as true perforations show that the specimens were so folded.

2. It is impossible to state with certainty whether an early perforation of the membrane of Descemet aids and advances total perforation or not. On this point it seems to the writer that Fuchs' assertion may be too far reaching.

It is important to note that in those cases in which an early perforation has been reported convincingly, it has been always associated with extraordinary conditions; that is to say, for example, with absolute glaucoma. This glaucomatous condition may have some importance, because in the cases in which the condition has not existed previous to the formation of the ulcer, the membrane of Descemet has always been found to be intact.

4. New anatomical investigations made upon human eyes in which the lesion is not too greatly advanced, are indispensable; but with modern therapeutic resources, at least, for those eyes which have been previously healthy, such opportunities for study are becoming increasingly rare.

5. The lesions of the posterior layer of the iris, described by Nuel, do not appear to have been frequently observed.

6. It is indispensable that authors who report cases hereafter shall lay proper stress upon the bacteriologic examination, and that they shall make this very prominent in an effort to establish the relationship between the various types of infection and the lesions that accompany them.

Bacteriologic Researches upon the Types of Conjunctivitis found at Copenhagen.

Lundsgaard, Copenhagen, (*Annales d'Oculistique*, October, 1900). During a period of two years Lundsgaard examined ninety cases of conjunctivitis. The gonococcus was found fifteen times, four of these cases being in infants. The pneumococcus was also found fifteen times. In eight cases which were apparently epidemic it was seen in pure culture. In two cases the discharges were purulent or seropurulent in character, and in one of these two cases were sufficiently virulent to kill mice. In five cases micro-organisms resembling the pneumococcus in everything but the presence of a capsule were seen. These cases were chronic and the organisms disappeared at the same time that the disease was cured. The same variety of pneumococcus was observed in three additional cases of conjunctivitis, but for certain reasons not mentioned, the observations lacked value. No indubitable examples of pure streptococci infection were found. In one instance cultures from the discharge of the eyes of an infant re-

vealed pure streptococci; but they were not virulent. In a large number of cases, staphylococci were determined, but they were usually seen in small quantities, and were not virulent. They were discovered once in a new-born. Thrice, the author had reason to suspect the presence of the bacillus of Weeks, these cases being non-virulent. The diplobacillus was found frequently; the bacillus of diphtheria but once. In one case a bacillus resembling that of the coli communi appeared, but it liquified gelatine and rendered urine alkaline. Non-virulent staphylococci, the bacilli of xerosis, and sarcinae were found several times.

Ocular Tuberculosis and Its Treatment.

Galezowski, Paris, (*Recueil d'Ophtalmologie*, October, 1900). Galezowski, in a brief article devoted to this subject mentions the following forms under which this disease has come under his notice; engorgement of the lacrimal gland, tubercles of the iris, tubercular choroiditis, and optic perineuritis. He classes the cases reported as tubercular conjunctivitis as being doubtful. Tubercles of the iris he considers may be confounded with gummata, but the fact that they are small and scattered over the organ will usually serve to differentiate them from the larger, generally single, syphilitic manifestations, even when the latter are unaccompanied with keratitis, and a cloudy vitreous humor. Nevertheless, he says, the surgeon should search for tubercular foci in other portions of the body in order to make his diagnosis certain. Tubercular choroiditis, he believes, is a more common affection than is generally supposed, the author seeing one or two cases every year. Tubercular perineuritis may be provoked by tubercles of the brain, or a tubercular meningitis. It resembles closely the optic neuritis accompanying other brain tumors and other forms of meningitis, except that it appears as a diffuse, incomplete perineuritis, which develops slowly. Treatment, he says, should be constitutional, while operative measures should be postponed as long as possible.

Traumatic Myopia Produced by Distention of the Zonule of Zinn.

Guende, Marseilles, (*Recueil d'Ophtalmologie*, October, 1900). One year previously a fifteen-year-old male, seen by Guende, was struck on the left eye with a hard ball, rendering him unconscious. At first the vision of the left eye was diminished to such an extent that he could not recognize people standing around him. Four or five days later when seen by the author, he was suffering from photophobia and lachrimation. The eye was injected, the pupil was dilated, and the iris did not respond to light-stimulus. Movements of the

eye produced a slight trembling of the iris, and the crystalline lens. The optic nerve-head was hyperemic and hazy in outline. The macular region was involved. The retinal veins were engorged and tortuous, and the corresponding arteries were dilated. Tension was above that of the other eye. The vision of the left eye, which was best obtained with a concave lens of three and a half diopters' strength, was one-tenth of normal. Antiphlogistic treatment, with the employment of a collyrium of eserine was instituted. One week later, tension had fallen to normal. Vision with correcting glasses still remained three-tenths of normal. In every other respect the eye was much improved. From this time on, vision steadily bettered, and soon after the myopia began to gradually disappear. Eight and a half months after the accident, vision without a correcting lens was eight-tenths of normal, and with a concave glass of half a diopter's strength it was normal.

It is of importance to note that over two years before the accident, the author had corrected the refraction error of this patient, and had found a simple hypermetropic astigmatism of one-half of a diopter against the rule. He regards his case, in conjunction with similar ones reported by others, as adding confirmation to Helmholtz' theory of accommodation. He says that the belief that the zonule of Zinn was injured was proven by the trembling of the iris, and the crystalline lens. This allowed, he believes, the latter to become more convex, producing a myopia; the degree of the refraction error produced being much less than the normal amplitude of accommodation for the age of the patient. This the author attributes to a distention, and not to a rupture of the zonule of Zinn. Prognosis in these cases, he thinks, is usually favorable.

Iridectomy in Glaucoma.

Abadie, Paris, (*Archives d'Ophthalmologie*, November, 1900). Abadie defines the class of cases that are suitable for iridectomy and those that demand sympathectomy. Unfortunately, he says, the latter operation has received a certain amount of unjust condemnation on account of the failure of some operators to obtain the desired results. This is due chiefly to a failure to select cases which are suitable for the operation.

He says that in the acute and the subacute forms, with corneal troubles; and in the types with intermittent crisis, and clouding of the visual field with colored circles around flames, though with complete remission between the crises, an iridectomy should first be performed; and only in case of this failing, should sympathectomy be resorted to.

He believes in chronic simple glaucoma we should commence by the regular employment of miotics twice a day, and if this be sufficient we should rest content. If, in spite of the regulated use of these drugs, vision continues to diminish we should practice ablation of the superior cervical sympathetic ganglion.

On the Action of Iridectomy In Glaucoma.

Jocqs, Paris, (*La Clinique Ophthalmologique*, November 25, 1900). Taking as a basis two cases in which glaucoma followed occlusion of the pupil and were cured by iridectomy, Jocqs declares his belief that hypertension in this disease is continued by the stoppage or the difficulty encountered by the aqueous humor during its passage between the anterior and posterior chambers, this being relieved by a section of the iris. He says, in glaucoma the lack of communication between the two chambers constitutes the principal obstacle to a cure. In idiopathic acute glaucoma the primary cause of the hypertension, he believes, lies back of the iris, and is probably the consequence of a vasomotor disturbance.

In certain secondary glaucomas the primary cause consists in an obstacle in the channels of elimination of the anterior chamber (sclerosis of the iris, obstruction of the spaces of the sclero-corneal reticulum, and consecutively, occlusion of these spaces by the base of the iris.)

Whatever, he says, may be the original cause, the result is a general hypertonicity of the entire globe, which closes the pupillary passage. This occlusion to the pupil constitutes the principal hindrance to a cure of acute idiopathic glaucoma; and it serves as a secondary, but a very important obstacle to the cure of consecutive glaucoma by augmenting the difficulty already existing to the elimination of the aqueous humor.

In the two cases studied by the author, iridectomy was found to be the most useful operation, as it opened a communication between the anterior and posterior chambers. He believes that in the majority of cases of keratotomy and the various forms of sclerotomy have but a temporary effect. As for the operators whose aim is to incise the iridosclerocorneal junction, they do not facilitate any permanent elimination of the aqueous humor. In fact, he says, the cicatrices which follow would point rather to a danger of an opposite effect from that which has been intended..

Sclerotomy and Iridectomy Combined.

De Wecker, Paris, (*Annales d'Oculistique*, November, 1900). For the relief of glaucoma, De Wecker recommends that an anterior sclerotomy should be performed before an iridectomy is done. In brief, he says:

1. It removes from iridectomy the dangers which it undoubtedly presents in a certain number of cases of recent glaucoma, as well as that in which the disease has progressed greatly, and in which the limit of the field of vision threatens the fixation.

2. A long experience has proven to the author that sclerotomy executed alone not only diminishes the danger of an iridectomy performed at a later date, but also enlarges the visual field; constantly pushing back its internal limit from the point of fixation.

3. In all cases in which one is tempted to perform the sclerotomy alone, the addition of an iridectomy will have the advantage of giving the greatest curative action of operative type, and will prevent the operator from having to attribute to himself the failure to obtain from sclerotomy that which an iridectomy or a combination of the two operations might have given to the patient.

4. Finally, when by the combination of the two operations the glaucomatous condition has been cured or arrested in its march, the surgeon may feel much more tranquil as to the future of his patient; the operation having been rigorously performed; and further, if, after a certain number of years the curative effect of this double intervention should commence to pass away, he will have nothing with which to reproach himself, as he attacks the field of previous operative procedure.

On Hemorrhage Into the Vitreous Body During Cerebral Hemorrhage.

Terson, Paris, (*La Clinique Ophthalmologique*, November 10, 1900). The previous history of the patient seen by Terson was negative, as was also his family history, except that about two years before seeing the author he was seized with an attack of left hemiplegia, while attempting to raise himself from bed. The lower portion of the right face was also affected. He fell back on his bed unconscious, remaining in this condition for nearly twenty-four hours' time. From the moment that he regained consciousness he realized that he was absolutely blind in the left eye. A few days later an ophthalmoscopic examination showed that the fundus-reflex was lost. The pupil was black. There was no sign of any blow or injury to the organ. The other eye was normal.

Although the paralysis gradually disappeared it was not until eight months later that a slight reflex could be obtained. Vision with the affected eye amounted to light-perception only. Gradually, the vitreous body showed signs of clearing, and in time, the hemorrhagic mass gave place to floating membranes in an otherwise clear medium. In eleven months'

time after this, the patient could see to count fingers with the diseased eye. Four months later, the condition was as follows: The fundus was visible. Small movable flocculi giving the appearance of black dust were situated in the vitreous body. Vision with the eye with the aid of a three and a half diopter convex lens equalled two-thirds of normal. Independent of a slight haziness of the borders of the optic disk the ophthalmoscopic picture did not differ from that of the fellow eye. The visual field was normal.

A comparison of this case with the reports of eye lesions seen in other cases of cerebral hemorrhage lead the author to the following conclusions.

1. This case shows the exceptional fact of a hemorrhage filling the vitreous body of an eye of the opposite side which was affected by a hemiplegia that was apparently due to a cerebral hemorrhage.

2. It has never been proven that such intravitreal hemorrhages are due to the passage of blood through the papilla; such a condition has never been shown by autopsies of hematoma of the optic nerve. The more probable cause is that the hemorrhages are venous, due to stasis.

3. The lesions of the fundus of the eye which accompany cerebral hemorrhage are various and inconstant. They lend no aid as yet to a precise diagnosis of the cerebral condition, although capillary edema and retinal hemorrhage are more often seen in vast cerebral hemorrhages than in embolus and softening.

Note on the Extraction of Cataract by the Scleroconjunctival Bridge Method.

Vacher, Orleans, (La Clinique Ophtalmologique, November 10, 1900). About a year ago Vacher reported forty operations by this method, all of which were successful. He has now doubled the number, the second series containing but one failure. In this case a panophthalmitis appeared in a patient who developed a carbuncle of the neck. Excepting in this case there was not a single instance of hernia of the iris.

Several physicians have written to the author reporting satisfactory results by this method. The procedure requires a more delicate technique than that during the ordinary methods, and there is one inconvenience, namely, a slight, though disturbing conjunctival hemorrhage which appears in about one-half of the cases.

The advantages of the method are the impossibility of reversal of the flap, the rarity of hernia of the iris, the early removal of the dressing, the absence of the necessity of bandaging the fellow eye, and a lessening of postoperative astigmatism.

The Ophthalmoscopic Stigmata of Conceptional Syphilis.

Cruchaudeau, Brevannes, (La Clinique Ophtalmologique, November 10, 1900). Under this heading two cases in women whose eyes showed the slaty tint and pigment heapings in the fundus as described by Antonelli under the title of "Rudimentary Ophthalmoscopic Stigmata in Hereditary Syphilis" are reported by Cruchaudeau. Close questioning elicited the fact that the first of these patients had been delivered at term of a still-born child, showing syphilitic signs, this being followed in due time by the birth of an undersized puny infant which died shortly. The second woman had two healthy children; after the birth of the second of which her husband left her for a period of two months. When he returned he was found secreting himself to practice some treatment. After this she had several abortions, but never any full term living children.

One of the features of both cases was an intense nocturnal headache. The vision of the first case was reduced, but that of the second was normal. Daily doses of thirty grains of iodide of potassium cured the headaches in both cases and cleared the fundi. In the first case vision was fully restored.

On Some Rare Forms of Syphilitic Keratitis.

Wicherkiewicz, (Annales d'Oculistique, November, 1900). Wicherkiewicz states that although one author follows very closely in the footsteps of another in classifying keratitis, both in regard to its pathology and its etiology, yet the matter is probably situated by no means on an absolutely firm basis. He presents several rare forms of the syphilitic type of the disease. He has found that: 1. Besides the form of corneal inflammation known under the name of diffuse parenchymatous keratitis, and independent of the keratomalacia of the newborn hereditary syphilitic type, the cornea in children may be subject to other pathological modifications that are dependent upon either hereditary or acquired syphilis. These are: (a) Infiltrations of yellowish gray zones, which may be either single or multiple. These areas usually disappear after a rather long time, leaving slight opacities that in accordance with the superficial or deep positions of the initial infiltrations are either superficially or deeply situated. In the deep varieties, as, for example, in parenchymatous keratitis, groups of vessels may be seen; (b) limited parenchymatous keratitis leaving but a very slight opacity as a sequel. In this variety the deep vessels may persist for quite a long period of time: 2. The two forms, nodular syphilitic keratitis and partial marginal parenchymatous keratitis are often uncertain, being masked by a scrofulous keratitis. In other cases these forms may be readily differentiated from the beginning. However,

on account of their close resemblance to the phlyctenular and vascular types of corneal inflammation, they often remain unrecognized and are ineffectually treated for long periods of time; when a specific treatment would cure them in a very little while. Diagnosis is facilitated by a detailed examination of the general condition and an adequate study of the patient's antecedents.

The opacity of syphilitic nodular keratitis extends beyond the level of the cornea. It is yellow rather than gray in color. There is an absence of superficial vessels, although the deeper ones are frequent. There is not any tendency to softening. Phlyctenular keratitis, on the other hand, presents a grayer infiltration and the inflamed area is often surrounded by superficial vessels. There is a tendency to softening with the production of ulcerative areas. It produces much greater disturbance and is frequently accompanied with irritation of the entire organ.

Apropos of Lacrimal Tumors.

Armaignac, Bordeaux, (*Annales d'Oculistique*, November, 1900). Armaignac shows that to him belongs the credit of an early word on this subject. Several years ago he described the existence of a separate cyst in front of the lacrimal sac in cases of dacriocystitis, but as the description was used in a text-book instead of through the medium of a medical society, his assertion was either unnoticed or was forgotten. He regards the formation of such cysts as secondary and due to pressure on the lacrimal sac, the walls of which break.

Diphtheritic Conjunctivitis.

Mathieu, (*Annales d'Oculistique*, November, 1900). Mathieu reports a case of a typical diphtheritic conjunctivitis occurring in a child who suffered from facial impetigo. From a study of the case he deduces the following lesson: 1. In treating a child suffering from an eruption on the face it is the duty of the physician to pay close attention to the eyes and to protect them by all the means at his disposal. 2. The appearance of an ordinary degree of hyperemia of the conjunctiva should be considered as demanding an immediate bacteriologic examination of the conjunctiva. 3. If cultures should show any noteworthy number of colonies of the bacillus of Loeffler, or if inoculations are positive, antitoxin should be injected into the membrane or even instilled upon it. 4. To fight the pyogenic organisms, which seriously threaten the cornea, free conjunctival irrigations and disinfection of the edges of the eyelids should be resorted to. 5. When a bacteriologic examination is out of the question, the best sign of a grave condition is the presence of an adherent exudate on the tarsal conjunctiva. In such cases, whether the pharynx be attack-

ed or not, antitoxin should be immediately employed locally. 6. Under similar circumstances should the pharynx be invaded during an apparently catarrhal or croupous form of conjunctivitis, the same care should be given to the eyes as in cases which are known to be diphtheritic in character.

Opticociliary Resection in Cases of Absolute Glaucoma.

Fage, Amiens, (*Recueil d'Ophthalmologie*, November 1900). Fage, who has had much experience in several operations of this sort, believes that opticociliary resection deserves more recognition than is vouchsafed it. The principal objection to it, he says, is the danger of hemorrhage which will produce an exophthalmos with sloughing of the cornea, necessitating enucleation. The relief of tension which follows its performance, is probably, due to two causes: A moderation or cessation of the secretion of the aqueous humor, owing to a cutting of the ciliary nerves and a freer liberation of the contained fluids by means of the pupillary passage—this being brought about by an opening through the sheaths of the optic nerve.

Nature and Treatment of Hysterical Amblyopia.

Barraquer, Barcelona, (*La Clinique Ophthalmologique*, December 10, 1900). Barraquer makes the ordinary statement that in this affection the supposedly blind eye actually sees, but that the patient does not realize this, owing to his mental condition. Hypnotism, he thinks, as a therapeutic measure, is unavailing in the treatment of this disease, which yields, however, to carefully induced impressions. It may be necessary in some instances, he says, to extend the pseudotreatment over a long period of time; while in others, a better effect can be produced by a suddenness as it were, of supposed therapy. If the patient expresses a strong belief in certain lines of treatment, it is well to either employ or simulate them. Three cases illustrating the various differences mentioned are given in detail.

A Contribution to the Study of Foreign Bodies in the Orbit.

Calderon, Madrid, (*La Clinique Ophthalmologique*, December 10, 1900). Calderon relates the history of two very interesting cases showing the remarkable tolerance which the orbit at times exhibits to the presence of foreign bodies. In the first case almost an entire steel pen remained in the orbit for three years without giving rise to any trouble. Finally, however, it produced an inflammation which subsided upon the removal of the foreign material. In the other case, a piece of wood of irregular shape, and about four centimeters in length, and eight millimeters in breadth, remained in the orbit for three months' time, when the eye became irritated

and the patient suffered from an epistaxis. After removal of the foreign body the symptoms disappeared.

In each instance, the foreign body was lodged below the ocular globe, and in neither case was the lower eyelid injured. There was an apparent absence of injury to the nerves and blood vessels, despite the fact that the orbital cavities were deeply penetrated.

ABSTRACTS FROM SPANISH AND PORTUGUESE OPHTHALMIC LITERATURE,

BY ALBERT B. HALE, M. D.,

CHICAGO.

(QUARTER ENDING DECEMBER 31ST, 1900.)

Blepharoplastio Operations.

Alonso, Dr. Antonio, (San Luis Potosi, *Anales de Oftalmologia*, June, 1900). As an introduction to the description of a case in which he has lately operated, concludes that the best operation for the restoration of a lid is the Italian method, by which the skin graft is taken from the arm with a small pedicle, although the method of sliding flap from the forehead, if carefully performed, has, perhaps, equal advantages.

He emphasizes two details which must always be borne in mind when operating—the first is to make the flap of the same shape as the denuded area, but 1-4 or 1-5 larger; and second, to take the flap from below when the upper lid is to be restored, and from above when the lower lid is to be restored. He illustrates these conclusions by a case of a young woman, 24 years of age, subject to epilepsy, who five years ago had fallen into the fire and burned the right upper lid very severely so that the lid could not be closed. It was adherent, especially in its middle, to the upper margin of the orbit, and the eye had begun to suffer exceedingly from the exposure. The lid was released from its adhesions and a large flap was taken from the temporal region of the cheek. The effect cosmetically was very flattering, an incidental gain being that the ulcer of the cornea was quite cured and the general infiltration of the mucous membrane very much diminished. It was done under cocaine anesthesia.

Sarcoma of the Orbit.

Alonso, Dr. Antonio, (San Luis Potosi, *Anales de Oftalmologia*, June, 1900), reports a case of intraocular tumor in a child two and a half years old. The tumor was practically congenital, but produced no pain up to a few months before, when the stomach began to be affected, the eye to be destroyed, and finally it ulcerated. On examination it was seen that the tumor had practically destroyed the eye, and was now in a suppurating condition. The child complained a great deal of headache, and evidently the brain was affect-

ed, as there were repeated attacks of vomiting. The temperature was above normal. An operation was decided on at once, and the orbit was thoroughly scraped. Although the author was satisfied that he had not removed the tumor completely, yet the improvement in the child's condition was so rapid and so noticeable that he dismissed it. However, the tumor did return at the end of two or three months and the child died of general metastasis. Careful examination of the tumor showed that it must have been of the embryonic sarcoma type, originating in the nerve structure.

Ocular Surgery in the Tropics.

De Obarrio, Dr. P., (Boletin de Medicina y Cirurgia, Guayaquil, March, 1900). Dr. de Obarrio discusses the reaction which the eye undergoes to surgical interference within the Tropics, and concludes that they are more favorable than otherwise, especially if a rigid asepsis is preserved. He has made several culture experiments with the fluids of the normal conjunctiva, and although they do not differ very much from similar experiments made in much colder countries, yet he shows as a fact that suppuration is less apt to take place in the Tropics than elsewhere.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

By E. E. BLAAUW, M. D.

BUFFALO, N. Y.

(QUARTER ENDING DECEMBER 31st, 1900.)

Transactions of the Sixteenth Meeting of the Netherlands Ophthalmologic Society at Amsterdam, December 10, 1899. Twenty-four members and two guests; presided over by Dr. C. H. A. Westhoff.

Measuring Units In Functional Examination of the Eye.

Prof. H. Snellen, Sr., proposed his way of indicating the axes of the eye: 0° at the vertical meridian; counting till 90° towards the temporal side and towards the nasal side. He began this method in 1868; it shows the symmetry of the eyes; it is rational, because the strongest refraction happens mostly in this meridian; as the anatomist divides the skeleton through the median plan in two parts, so we can readily divide the eye along the vertical meridian. S. prefers his way to Knapp's, proposed by him at the congress in Utrecht. S. indicates the different meridians of the visual field in agreement herewith, beginning at the upper vertical with 0, counting till 180 towards the nasal and temporal side. He uses the so-called equidistantial projection. In measuring the movements of the eye in squinting we go out for the fixing eye from the primary position. Wrongly the same has been done with the squinting eye. We should start from the position, which the squinting of the eye assumes, while fixing the is in the primary position. This discrimination is of great importance for the prognosis of a tenotomy. S. complains that his test types are not used universally in the same way; his demand for illumination and adaptation has been set aside; some were satisfied, when the easiest forms could be guessed; the value of his standard angle has wrongly been taken for normal or maximal visual acuity; others do not give numerator and denominator as found, but reduce the fraction, or worse, give the decimal fraction.

Dr. J. Green at St. Louis represented a series with a factor of 3.05. The operations of G. J. Van Wy, of H. Kuchler and of Wenzel. Prof. H. Snellen demonstrated the "cataract-snepper" of van Wy; the mechanism is hidden in the handle; at the base of the knife there is a small opening. A small hook draws

the knife back, till a spiral spring is screwed up; after pressure upon a small button the knife moves rapidly forward. The instrument has only historical value. We make use of Kuchler's operation only in progressive staphyloma corneae or sclerae. K. was born at Darmstadt in 1811. He was one of the first to use reading test types (1843. "Schrift-Nummerprobe für Gesichtsleidende"). After a careful study for twelve years, he published in 1868 his "Querextraction des grauen Staars der Erwachsenen;" he used a Beer's knife, made a horizontal incision across the cornea, opened the capsule and pressed the lens slightly outward. The two Wenzel's, father and son, were celebrated eye-surgeons. In cataract extraction they opened the capsule before finishing the corneal incision, a way nowadays followed by Trousseau in the "Quinzevingt." Wenzel described how, in a case of atresia, pupillae, a central iridotomy can be connected with the cataract operation (1786). He perforated the iris and makes a smaller flap wound of the iris simultaneously with the corneal incision. This iris flap can be cut with scissors. In the same way he formed a central pupil after extraction in case of atresia pupillae. Their great value is to have taught how we may boldly attack the iris simultaneously with the keratotomy, and to have recommended as a method for certain cases the simultaneous cutting of the iris, in all cases where the anterior chamber is absent through glaucomatous pressure behind the lens or through swelling of the lens itself.

S. reported a case performed during the past year with very satisfactory result.

Contribution to our Knowledge of the Rolling Movements.

Dr. G. J. Schoute mentioned that the rolling movements executed by the eyes when the head inclines towards the shoulders, are called compensating or parallel. This last name only is right, when the rolling of both eyes is equal. S. examined this with the instrument demonstrated by Prof. Mulder in 1897, after having arranged it for measuring both eyes together. It is a rolling disc, kept vertically before the eyes with a mouthpiece; a mark is opposite the blind spot on fixation of the center. The disc is turned till the mark just passes the margin of the blind spot before and after the movement of the head, of which one wants to examine the influence; the difference between these two positions indicates the extent of the rolling movement.

S. found the rolling of both eyes nearly equal. Inclining the head over 90° he found, on an average of 56 observations for the right eye, a rolling movement of $5^\circ 17'$, and for the left one $5^\circ 4'$, on an average of 136 for the right eye $5^\circ 26'$ and for the left one $5^\circ 24'$.

On increasing inclination of the head, the rolling movement of both eyes increases in the same way, always slower, so that at an inclination of 60° , the maximum is nearly reached. This increase happens to both eyes in the same way, as when one experiments with one eye.

S. does not believe the method of Donders conclusive. Donders put two vertical bars on a mouthpiece at a distance of 70 millimeters, parallel with his apparent vertical meridians. The parallel half-images remain so at inclination of the head. If the rolling movements should not be parallel, then the parallelism of the half-images could provoke an abnormal rolling movement, to restore the disturbed balance, as happens when we make the image of a vertical line oblique through a prism before one eye.

S. found on turning leftward over $+90^{\circ}$, that the left eye executes a negative rolling movement of $-1^{\circ} 37'$, the right one a positive of $+1^{\circ} 24'$; turning the head towards the right over $+90^{\circ}$, the left eye makes a negative rolling of $-1^{\circ} 45'$, and the right one a positive of $+1^{\circ} 32'$ (the medium from 36 observations). The upper halves of the meridians rotate thus towards the temporal side. This symmetrical rolling movement has not been noticed before.

Eye-Diseases In Connection with Nasal Affections.

Dr. Struycken—The ophthalmologist should be able to treat the most common nasal diseases. Conjunctivitis and keratitis phlyctenulosa are mostly associated with adenoids or an enlarged pharyngeal tonsil with a consequent hypertrophic rhinitis. Not only the adenoids, which obstruct the respiration, are here of importance, but more still, we have to look for the smaller multiple, much secreting growth. Conjunctivitis chronica and follicularis, and different forms of blepharitis are very often associated with the same growths or with enlargements of the under and middle concha. The best treatment is operative interference. Spinae and spicae septi cause more asthenopia. Removal should be practiced with the trepan or button scissors after Rupprecht, with cotton pledgets, with 3 per cent eucain during 20 minutes. Epiphora is often caused by nasal affections. Generally we know that empyemata of the sinuses cause eye diseases; especially those of the sinus frontalis and ethmoidalis cause extra and intraocular affections, those of the sinus maxillae more extraocular ones in the form of abscesses; those of the sinus sphenoidalis more neuritis and choroiditis.

Preliminary Communication About an Affection of Skin and Eyes of Persons who Work With Hyacinth Bulbs.

J. Waller Zeepers: The symptoms are those of conjunctivitis with photophobia and epiphora, and intense itching of the

skin. They appear in August, September and October, when the dried bulbs are handled and assorted. S. found in healthy and diseased bulbs masses of crystals in needle form, in bundles and singly. The same crystals are found in the bulb-dust, and also many living mites and larvae. This mite is as large as the cheese-mite, related to or identical with the *Leptus Autumnalis*, the larvae of *Thombidium Autumnale* (Schmarda).

S. did not find in the skin or conjunctiva of suspected persons, eggs, larvae or full-grown insects or their particles, neither did he find crystals. The dust, that made an irritation on his own skin (itching, erythema, a few papules) contained many larvae, mites and particles of dead insects.

Dr. Morris showed microscopical preparations in the Linnean Society and concluded that the raphides (crystals of oxalis calcis) are the cause of the skin irritation. A French botanist found small mites with the (smaller) hyacinths in South France, and accuses them of being the original cause of the symptoms.

A Case of Paralysis of the Oculomotorius Recidivans.

Dr. H. G. W. Plantenga, reports the following case: Father healthy, mother suffered from gout, died suddenly; brothers and sisters not strong, but healthy.

Patient fell, three years old, from the cellar stairs, and had a violent commotio cerebri; no disturbances remained. He learned well, but suffered often from headache; he could then lift the right upper eye-lid only with difficulty. At ten years old he had a violent attack of headache, with vomiting, the right eye could be kept open only with exertion, and was not as wide as the left healthy one. No disturbance in vision, but since then the right pupil is larger than the left one. When 21 years old, August, 1894, he had a second intense attack: headache, vomiting and fever; three days later the right lid drooped and could not be voluntarily opened; this lasted two months, hereafter he noticed that he could not read with that eye without glasses. A third attack happened in September, 1896, with headache, vomiting, fever and shivering. The headache was of a piercing character; in and above the right eye; three or four days later the eye shut; after five weeks it was open again; patient squinted, suffering from double vision in lifting the right upperlid; right pupil very wide, without reaction for light or accommodation. Patient has no general pathological symptoms. The right conjunctiva bulbi is anesthetic. Strong pharyngeal irritation does not provoke vomiting. No other more significant hysterical symptoms. Examination in January, 1897, showed a weakness of convergence. Patient was then 23 years old, and could only

converge to 32 cm.; nearer, double images appear, and the right eye diverges. The right pupil does not react to light, accommodation only consensually with convergence. Left pupil normal. Vis. O. D. 5-8f. Vis. O. S.: 5-8 v. Refr, manif. H. 0,5 D. Left eye reads easily; right eye only with 2,5 D. Sn. 0,5. Ophthalmoscopic examination normal, in the right eye venous pulse. In December, 1897, patient suffered from another attack, with intense headache and vomiting, after the right pupil had been larger for some days. No ptosis, only to keep the eye open needs more strength and patient is somewhat dizzy on account of double images. After ten days he noticed a slight ptosis, but by looking straight forward no squinting could be detected. In April, 1898, a renewed attack which he can trace from the beginning. Fever, vomiting, more frequent pulse, intense pain in and around the right eye occurred. On examination the right eye is shut; with great difficulty it can be opened a little, then he sees double; strabismus divergens exists; the movement towards the inner corner is chiefly lessened. On the lips and right ear are herpes-vesicles. After a few days the eye was open again, double vision disappeared, only the right eye was directed somewhat outward. Of this disease some 40 cases are known.

Pl. puts the prognosis not infaust quoad vitam.

The Existence of Trachoma at Samarang (Java).

Dr. H. J. Kessler found in 1892, in the Roman Catholic Orphan Asylum among 289 children, 57 cases of most intense trachoma. In 1895 he found in the Protestant Orphan Asylum among 148 children, 59 cases, some complicated with corneal affections. In November and December, 1897, K. examined 868 children in the public schools, he found 300 cases of trachoma: 34 per cent; of these, 125, were intense forms. Obscurations of the cornea were not found, like Hirschberg noticed in East and West Prussia. The cases were more or less regularly divided between the different schools, with the exception of one for girls from the better classes, with 22 per cent, and one for girls from the poorer classes, (mostly Indo-Europeans) with 46.5 per cent. K. examined native men between 20 and 50 years; 30 per cent suffered from trachoma, mostly of the cicatricial form, with a few granula; relatively seldom corneal affections or their sequelae were found. The disease was often not treated, or sometimes had been with instillations of strong plant-saps or with a fine Chinese powder. Examinations en-masse of native women and children were impossible. K. found few cases among children from African negroes. He accepts a lesser susceptibility for the African negro race.

We may accept that the disease is endemic with the native population, and is carried through the women-servants to the children. The "slendang," or suspensory belt is here an important carrier of infection, as it serves not only as palanguin, but also as handkerchief and towel for herself and the children, and is not renewed too often.

K. wants the government to take preventive measures; that it should accept no functionary, if not free from trachoma; no child should be admitted to the public school if not free from trachoma; inquiries about the school going children every three months; competent physicians to treat and diagnose trachoma.

Conjunctivitis of Animal Origin.

Dr. H. J. Kessler was consulted by the patient February 14th, 1894, at Samahang, on account of a feeling of tension in the left eye, with slight mucous secretion; in the upper fornix, a few isolated swellings, simulating granula with papillary swelling. The right eye was and remained normal. I suspected trachoma granulare, as there existed a possibility for previous infection. Cauterising as in trachoma, had quite a different effect, an edema palpebrarum with serous secretion was the result. Recapitulating the anamnesis I found that the day before pat. had trained his horse suffering from "benign glands," and had remained often at its head, so that an infection was quite possible, as an infectious secretion was coming continuously from its nose. A few days later the pre-auricular lymph gland was swollen and shortly after the submaxillary and superficial glands; they did not become very large, but hard and painful. After four weeks K. had to incise the preauricular lymph gland. The glands at the right side of the neck were slightly swollen. Pharynx and naso-pharynx were red and swollen with muco-serous secretion. Four weeks after the beginning, after his daily nasal-douche, edema pharyngis and glottidis with an intense need of breath arose, which ameliorated after scarifications of the pharyngeal wall and ice, in and externally. A strong anorexy and nearly regularly an evening temperature between 38° and 39° existed during the whole course of the eye-disease. The defects after cauterisation became ulcerations with a grayish coating, which healed only slowly after a few weeks. The intumescences increased in number and size, so that eight days after the beginning the whole conjunctiva was covered with large cock's comb swellings. The secretion was abundant muco-serous, sometimes with some pus. Cornea remained normal. No bacteriological examination. After three months the conjunctiva was healed.

The whole process points at a strong infectious agent; the

conjunctival affection corresponds with a tuberculous infection or the disease described by Parinaud ('89) as conjunctivitis infectiosa of animal origin. The development of the intumescences and ulcerations was opposite as in tuberculous infection, also the favorable course.

Although no bacteriological examination was made, I think to have the right to conclude from the clinical picture, that this disease is caused by the *Streptococcus aequi*, which is the cause of "benign glanders" in horses.

Tumor of the Upper Eyelid.

Dr. C. H. Hazewinked reported the case of a tumor of the upper eye-lid, which microscopically looked like epithelioma papillomatotum, while microscopically the impression is made of luxurious growth of the papillar stroma through inflammation, thus, papillomatous inflammation. Pat. was 64 years old, discovered five weeks previous a warty growth on his eyelid, which bursted after two weeks, and "matter" escaped; during three weeks this tumor had gradually grown.

Striped-Keratitis.

Prof. H. Snellen, Jr., saw only primary cases, in one case the affection was monocular. In 1897 he scraped a case with the best result; the opacity was a chalky, thin, friable membrane, which could be lifted from the underlying tissue; after restoration of the epithelium; vision was 6-viii.

Lately he treated a patient in the same way, first taking the most opaque cornea, because he complained about pain in that eye. Here also he could lift the opaque mass as a thin chalky layer. Prof. Pekelharing found it to contain carbonate and phosphate of chalk, chiefly the latter. With haematoxylin it colored without showing any organic substratum; a part first freed from chalk and then colored, showed to contain a mass of cocci. They were thus included entirely within the chalk. Probably the zoogloea was here primary with secondary calcination of the bacterial slime, as happens in the formation of tartar. These bacteria had not lost their virulence, as notwithstanding all aseptic precautions an ulcer cum hypopyon advenitia occurred.

Corneal Degeneration.

Dr. D. J. Blok demonstrated two girls, 18 and 16 years old, both suffering from what was to him an unknown form of corneal-affection. No hereditary influences. During four years diminishing of the vision, without any irritative phenomenon ever having been present. Medication without any result. In the beginning, small round patches in the anterior layers of the cornea are to be seen, the epithelium is entirely intact in the center. These patches become more opaque and elevate the epithelium slightly. Then new, still trans-

parent, patches form more towards the periphery of the cornea without touching the outer corneal margin. The central epithelium becomes more irregular and the vision diminishes quickly. No changes in fundus; media clear; iris entirely normal. Only subjective symptoms; photophobia and important diminution of the vision. The disease corresponds the most with the so-called "gittriche" corneal-degeneration.

A Change of the Entropion-Operation of Jaesche-Arlt.

Peters, Dr. O. A., Paramaribo, (Weekblad v. Geneesk, June 9, 1900). mentions as one of the best descriptions of Jaesche's operation the one by Fuchs. The elliptic piece of skin, that is cut out, has been put back at the inside by Waldhauer; it dies very easily and shrivels anyhow. P. did not cut loose this piece, but kept it connected with the underlying tissue. The lid-margin and the elliptic skin-piece cross each other, the first one is pushed over the last one. To fasten the skin-piece is unnecessary; it is drawn down by the traction of the inner side of the lid. The woollen hairs it possesses do not irritate, as experience teaches. From analogical facts we may suppose, that those woollen hairs slowly disappear and that the skin will change slowly into mucous membrane. Because the inner side of the lid becomes larger with the skin-piece, the tendency for recidives will be less than with other methods. The method is to be tried for serious cases of trichiasis, for light cases the operation after Snellen will be sufficient.

A Case of Glaucoma Beginning with Tinnitus Aurum.

Bylsma, Dr. R., (Weekblad v. Geneesk, June 23, 1900), reports the case of an otherwise healthy woman, aged 59 years, who, during the night, gets attacks of a very loud noise in her right ear, so that she cannot keep her bed and walks for nearly four hours in her room, at very irregular intervals. The noise diminishes gradually, and except the feeling of insufficient rest no vestiges are present next morning. Even the hearing has not suffered. The left ear was deaf for years; the results of otitis media chron. sicca. The right ear, nose and pharynx were normal. While B. examined her eyes, trying to find a cause, patient told him that she noticed a rainbow around the lamp a few times during her nightly walks; she did not know with which eye, as she had not suffered from any pain. Vision O. D. 6-vii, O. S. 6-xxxvi, refr. H: 1 D. Tension O. S.; somewhat higher, O. D. dubious. Pupils somewhat wide, slowly reacting. Field of vision on the right side dubiously narrowed, on the left side at the nasal side important, as for red, green and white. Ophthalm, examination revealed glaucoma, the most intense on the left side. A new attack was waited for, which happened in the right eye. Miot-

ics cured the disease as far as possible. Most probably here is a disease of the sympathicus, although neither exophthalmus nor hyperidrosis have been observed.

Report of the Examination of 7,000 School Children.

Straub, Prof., (ibidem), reports about the examination of the eyes of 7,000 school children in Amsterdam, done with the assistance of Messrs. Van Der Meer, Dinger, Smit, Munten-dam and De Vries, (in the Biological section).

In the first place the pupils of the public schools (four classifications) were examined. Here the number of myopes increased from class to class, and from younger to older age. All begin with 1 per cent and less myopia in the lowest class. In the schools' first class the number of 4 per cent myopes is reached at the end. In the schools' second class, 6 per cent; in the schools' third class about 8 per cent, and in the schools' fourth class about 10 per cent. S. attributes this not to the differences in school—money and social position, but to the differences in teaching. Comparing emmetropes and hypermetropes we see change with the increasing age continually more hypermetropes in emmetropes. In the schools' first and second class always twice as many hypermetropes are present than in the schools' third and fourth class. The normal refraction emmetropia is reached in a greater number by the pupils of the schools third and fourth class, than by those of the schools' first and second class.

In the schools of secondary instruction and the gymnasium (grammar school) the number of myopes increases also from class to class, and from age to age. It is interesting, that the increase is much more in the grammar school and the "business school," and reaches a higher degree than in the five-year-course of the H.-B.-school (High school). In the grammar school 36 per cent is finally reached, in the "business school" 33 per cent, in the "high school" 23 per cent. In the high school, with three years' course, only 20 per cent myopia is found in the highest class, the corresponding third class of the high school, with 5 years' course, has 19 per cent myopes, of the business school, 25 per cent, of the grammar school, 26 per cent.

Congenital Abnormalities of the Eye.

Lechner, Dr. C. S., (Weekblad v. Geneesk, August 4, 1900), was consulted by a 11-year-old girl for pain in the eyes and asthenopic complaints, for which a conjunctivitis follicularis could account. He found at the same time the right pupil somewhat smaller and of pear-shaped form with the narrower part pointed externally and downward. The external-under border is a small band of connective tissue. Parallel therewith a black pigment mass can be seen in the iris, from which

a narrow pigment stripe goes to the periphery. The iris in that part is somewhat atrophic. The trabeculae are thinner and are more evidently parallel; the color there is also somewhat lighter. The pupillary reaction is good. Cornea normal. Fine pigment granules on the anterior lens capsule.

Ophthalm. I found a coloboma nervi optici, could see the fundus well with — 2 and — 3, but needed — 7 for the middle of the papilla. The vessels are distributed very irregularly; we cannot speak of a general trunk. Great large pigment-masses are obvious, and pretty much extending atrophy of the choroid chiefly at the underside of the papilla; no symptom of a coloboma choroideae.

L. considers his opticus coloboma to be the result of inflammation; there are symptoms of passed iritis (perhaps headaches from which pat. suffered in her first years depended on this); the large choroideal atrophy and pigment accumulations point all in that direction. The possibility that inflammation is the cause of more colobomata. (Haab, Fuchs, Deutschmann, Rindfleisch) becomes herewith larger. However, it is unnecessary that all forms originate in the same way.

Hyalitis and Cyclitis.

Straub (ibidem), in the medical society at Amsterdam, speaks about hyalitis and cyclitis, which formerly were united as cyclitis. S. thinks that not only from a pathologo-anatomical standpoint, but also in practice a division should be made. In the lighter cases of hyalitis, iritis with synechiae post. and a very troubled corpus vitreous are present. In the moderate cases the cornea is imbibated, synechiae of the pupillary margin, fibrin on the anterior lens capsule, a small hypopion are present, the tension is higher, which becomes lower than normal as soon as atropin begins to show its curative effect. As the pupil becomes wide the corpus vitreous appears filled with exudation. The intense forms of hyalitis, where the bulb perforates in a characteristic place, were formerly called panophthalmitis.

In cyclitis the corpus vitreous remains normal. Only a nebula of exudate can be formed before the optic nerve and the central part of the retina. Tension is mostly normal, becomes lower as the inflammation lasts longer. Usually an exudate is precipitated at the posterior surface of the cornea. Iritis, choroiditis and episcleritis can be present. Sometimes the diagnosis has to be made on account of the misproportion between the redness and pain on one side, and the slight changes in the iris on the other side.

Influenza, urethritis, measles, erysipelas or meningitis often precede hyalitis; S. never found lues as a cause in the

pure cases. Cyclitis mostly is the result of lues or tuberculosis.

Discrimination of Two Kinds of Photophobia.

Straub, Prof. M., (*Weekblad v. geneesk.*, September 22, 1900), demonstrated three patients with photophobia and blepharospasm, which retards the healing: No. 1 suffered from keratitis dendritica, (repeated abrasion, treated with Kuhnt's corneal "schaber." Pat. must be informed of the long duration of the process and the repeated surgical procedures.)

No. 2, a boy, 8 years old, with keratitis parenchymatosa; No. 3, a boy 6 years old, with ocular eczema and an ulcer corneae.

S. considers this photophobia to be for the greatest part psychical, acquired by auto-suggestion.

The photophobia is in no relation with the present ocular changes. A reflex exists from the optical cerebral sphere towards the eyelid muscles, and this reflex is increased here and in similar cases. They themselves turn off the light. An organic anomaly is nowhere in the ways of the reflex, retina-opticus-eyelid muscles. The higher sensibility of the reflex arises from induction. Through the continuous attention on the diseased part the reflex irritability becomes continuously stronger, the nictitatio becomes more intense and the eye-clefts at the end can only be opened forcibly by the physician.

It looks well in a scheme to oppose the organic and psychic eyelid spasm as trigeminus—and opticus reflex, but to tell the truth, I don't think that the opposition is so marked, firstly, because I don't believe that all pathological symptoms are exaggerations of normal properties; secondly, because it struck me that entirely blind eyes (which therefore have no right to have any photophobia) show very little blepharospasm when the anterior part of the eye is diseased.

This photophobia is often found in persons who are not nervous, still less hysterical. It is combated with psychic means of different intensity, and good nursing; with instillations of cocain, but only as aid to begin or to help the psychic therapy. I do not prescribe regular instillations of cocain or atropin with cocain; to have any effect on the spasm the instillations have to be repeated too often; the third means is immersion of the head in cold water (v. Graefe); it can be repeated; the fourth autoplactic (v. Graefe). The Antispasmodic remedies help the best when the patient trusts his physician; they ought to remain exceptions as the common local therapy neutralizes sufficiently. With good nursing those nonorganic nervous troubles are so much more difficultly neutralized, as they exist longer. Sometimes blepharospasm re-

mains as an independent disease after cure of the original eye disease. S. cites the case of a military man.

Some Observations on Our Optotypi.

Bylsma, Dr. R., (*Medisch-Weekblad*, June 16, 1900), points out that, as $Vision=1$, according to Snellen's types is not the normal for many persons; it is possible that a diminishing of vision and even a disease can be present with $V=1$.

Snellen's E. figures for illiterate people are seen with less visual acuity than they have been made for.

A disadvantage against S. types is their common notoriety, so that people can learn them by heart.

B. recommends strongly Straub's optotypi, where literate and illiterate people will get the same vision, and where the diversity is of great importance, for instance, in military medical examinations. Those, who have a small room for an office, can use Pfluger's types; they remain the same when reflected from a mirror. The visus, according to Landolt's open ring, (*Arch. d' Ophtalm. Aout. 1899*), corresponds very well with Snellen's types; only in some cases of astigmatism, i. e. if the normal meridian is perpendicular to the one in which the opening lies, especially for the small figures, it happens that the opening is seen very distinct, while a corresponding letter could not be seen any more.

ABSTRACTS FROM RUSSIAN AND SCANDINAVIAN OPHTHALMIC LITERATURE.

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(QUARTER ENDING DECEMBER 31ST, 1900.)

Dioptics of Eyes Having Different Refraction.

Auerbach, (Thesis, Moscow, 1900). The author ascertained the optical constants of 86 eyes, their indices of refraction excepted, in order to decide their influence on the different refractions. In 15 eyes E. varied. In 43 eyes M. varying from 0,5 D. to 25,5 D.; in 28 eyes H. varied from 0,5 D. to 16,0 D. The radius of curvature of the outer surface of the cornea, a measurement necessary for the calculations, was determined by the ophthalmometer of Javal-Schiotz, the remaining measurements being made with Tscherning's ophthalmometer.

Out of 86 eyes only two were found to be perfectly centered, in the remaining cases the angle alpha, i. e., the angle between the line of vision and that part of the optical axis which joins the center of the cornea to the center of the anterior surface of the lens, varied from 3° to 7° 36' in emmetropia, averaging 5° 22' 12", and from 3° 48' to 10° 06' in hyperopia, averaging 6° 24' 48".

	Emmetropia.	Myopia.	Hyperopia.
Radius of curvative of anterior surface of cornea.....	7.50—8.48mm Average 7.91	7.19—8.51mm 7.87	6.80—8.48mm 7.89
Radius of anterior surface of Lens.....	9.0544—12.8628 Average 10.47	8.7862—12.4155 10.44	8.5100—11.9559 10.87
Radius of posterior surface of Lens.....	5.1988—7.0621 Average 6.02	5.2595—7.4585 6.15	5.3153—7.1491 6.04
Thickness of Lens.....	3.2785—4.4675 Average 3.89	3.8561—5.07+0 3.88	3.2547—4.7886 3.94

The conclusions of the writer are as follows: The depth of the chamber of the eye, the radii of curvature and the thickness of the lens are subject to great individual variations. There is no strict relation between the refraction of the eye and the single dioptric elements, but in general it may be stated that a short sighted eye corresponds to a deeper cham-

ber, a thinner lens and a greater radius of curvature of the posterior surface of the lens. In very short-sighted cases the lens generally has a smaller radius of curvature in its outer surface, a greater radius of the inner surface, and is thinner; so that on account of the smaller radius of the outer surface and the thinner lens, a higher refractive power results, which is compensated by a greater radius of the inner surface, lowering the total refractive power.

The author also determined astigmatism of the lens in 10 cases, where he used Tscherning's ophthalmophakometer. Nine cases had simple astigmatism of the cornea, and one reverse astigmatism.

The astigmatism of the cornea varied from 1,8 D. to 5,7 D. Astigmatism of the lens was absent in one case, simple in five cases, reverse in four cases; the astigmatism varied from 0,5 D. to 2,1 D. In four cases the effect of the latter was to be added to the effect of the corneal astigmatism, in five cases to be subtracted from it. The astigmatism of the outer surface of the lens is usually of the same kind as that of the cornea, that of the inner surface usually of the opposite variety. The posterior angle varied:

Emmetropia from $3^{\circ} 18'$ to $7^{\circ} 42'$, average $5^{\circ} 22' 12''$.

Myopia, $0^{\circ} 18'$ to 10° , average $4^{\circ} 36' 36''$.

Hyperopia, $2^{\circ} 54'$ to $8^{\circ} 54'$, average $6^{\circ} 16' 12''$.

The angle taken vertically was determined in 10 cases; in these the optical axis lay deeper than the line of vision; the anterior angle varied from $0^{\circ} 18'$ to $4^{\circ} 36'$; the posterior angle from $0^{\circ} 6'$ to $4^{\circ} 06'$.

Depth of the outer chamber:

In E. from 2,7946 to 3,9705 mm., average 3,4 mm.

In M. from 2,8761 to 4,1866 mm., average 3,6 mm.

In H. from 2,8671 to 4,2339 mm., average 3,5 mm.*

*Note. Measurements for H. are generally not entirely accurate, as the author did not give enough attention to the accommodation of the eyes.

Excision of the Superior Ganglion of the Sympathetic Nerve in Cases of Glaucoma.

Schimanowsky, (Messenger of Ophthalmology, May-June, 1900). Age 70 years, O. S. glaucoma absolutum; O. D. chronic simplex glaucoma; T. +2, E. V.=0,1. Field of vision not contracted, excavation of the papilla not marked, pupils dilated and hardly contracted under influence of pilocarpin and eserin. After excision of right upper ganglion of sympathetic nerve pupil contracted immediately, T. decreased after one-half hour. About ten days after operation a rising T. was noticed twice. Tests with Oswald's tonometer gave T.=23° (46 mm. mercury) V.=0,2. One month later T. re-

maintained unchanged, only once rising to 30° (60 mm. mercury),
 $V. = 0.4$.

Etiology of Parenchymatous Keratitis.

Loewenson, (Messenger of Ophthal. March-April, 1900).
 Male, aet. 26, strongly built, healthy, good family history, suffered with *ulcus durum*; three weeks after, keratitis parenchymatosa developed in one eye, followed in a week by similar development in other eye. With the exception of the primary lues, author could find no cause for the disease of the eyes.

A Case of Lethal Bleeding of the Right Conjunctival Sac in Child Three Weeks Old.

Oetlinger, (Tschenedelnik Wochenschr. No. 15-16, 1900).
 On turning over the right upper lid of an undeveloped female child two weeks after birth, bleeding took place from the conjunctiva, followed the next day by hemorrhages of the skin. The bleeding could not be controlled, and death followed in six days. An autopsy showed markedly impoverished blood and hemorrhages into the internal organs. The writer thinks it was a case of congenital hemophilia.

Foreign Bodies in the Eye.

Masslenikow, (Tschenedelnik Wochenshrf, No. 29, 1900).
 Female, aet. 70, came to writer suffering with acute catarrhal conjunctivitis, examination showed small scar on cornea and complete cataract of lens. Patient said that eye had been blind 17 years, from injury made by splinter of wood. Examination under atropin showed a splinter about 1½ mm. in length, with one end on the lens and the other in pigment layer of retina. After accident the eye had pained for about a month, and then become blind, no other signs of inflammation were present. The other eye was normal.

Purulent Inflammation of an Infant's Eye, Caused by Congenital Atresia of Nasal Duct.

Nathanson, (Med. Review, April, 1900). A secretion of pus was noticed in an infant two or three days after birth; examination showed a mild conjunctivitis, with separation of thick flakes of yellow mucus in the retrotarsal fold, nothing exuded upon pressing the tear sac. Protargol cured one eye in ten days. After three weeks, upon pressing tear sac of other eye, a pus-like fluid appeared at the puncta lacrimalis. Daily cleansing of tear sac and use of protargol cured the disease in four weeks.

The material collected with all bacteriological care consisted of mucus, disintegrated cells, single neutrophyllous cells and a great quantity of diplococci, stained after Loeffler and Gram. The cultures appeared as round grayish colonies. Attempts to make a second culture did not succeed, the diplo-

cocci belonging to the non-pathogenic microbes. The disease of the tear sac had a superficial resemblance to dacryocystoblenorrhoea, and was caused by congenital atresia of the nasal tear duct.

The Use of Spermin in Ophthalmology.

Wygadsky, (Messenger of Ophthal., May-June, 1900). The writer used (Poehl's) spermin in 12 cases of optic nerve atrophy of various origin, two cases of choroiditis and one case of amblyopia. The vision of the cases under treatment was 0,8 to 0,1. Ten to 30 injections were made, one injection daily. The vision was not improved in any case; but on the other hand it was not injured, during treatment, except in one case.

Glioma of Retina, Structure and Development.

Selenowsky, (Physician, No. 5, 1900). Investigated a case of retinal glioma by method of Golgi-Cajal, his results agreeing in the main with those of Greeff and Haertel. The glioma consists: (a) principally of spider-like cells which are identical with the cells of the neuroglia, the spider-like cells of the retina and optic nerve; and of the inter-weavings of the arms of these cells; (b) of ganglionic cells of different sizes, among which are found some that resemble the embryonic cells of the retina.

Glioma may be developed simultaneously from four layers:

- (a) from the nerve fibre layer.
- (b) from the ganglionic layer,
- (c) from the inner granular layer.
- (d) from the outer granular layer.

The possibility of the development of the glioma in the layers where no spider-like cells are usually found, and the presence of nerve developing cells makes the view of Greeff very probable, viz: That the glioma is developed from the initial elements of neuroglia and ganglionic elements, which may remain in a quiescent state in any given layer of the retina for a certain time and develop later under favorable condition.

Purulent Metastasis of the Eye.

Propenko, (Messenger of Ophthal., January-February, 1900). Male, aet, 48, after having successfully undergone an operation of gastro-enterostomy post-colica, passed a stone which lacerated the mucous membrane and caused the formation of an abscess of the scrotum and pyemia; on the 18th of March the abscess was opened; on the 20th patient noticed he could see nothing with the right eye, and that an abscess was forming on the right side of the forehead; ophthalmoscopic examination showed ablatio retinae with fine hemorrhages; a week later iridocyclitis developed, followed by an abscess of the left forearm, and one on the left thigh. On the 24th of

In the sclera perforated down and out and a small amount of pus was exuded. In the pus from the eye and the abscesses, *Staphylococcus aurei* were found. Microscopic examination of the enucleated eye several months later showed a shrinkage of the detached retina, absence of the choroid at the place of perforation; elsewhere it was thickened, and its blood vessels greatly dilated. The metastatic inflammation was the result of the primary pustular infection of the choroid and not of infection of the retina.

Vibratory Massage in the Therapeutics of the Eye.

Ordashvili, (Messenger of Ophthal., January-February, 1900). The writer used the Edison spring modified for purposes of massage, by Professor Maklakow. The treatment lasted from five to ten minutes, the ball of the apparatus pressing the eye directly. In only one out of 13 cases of conjunctivitis parenchymatosa was a good result obtained. Massage was likewise useless in two cases of posterior synechiae and 14 cases of macula and leucoma corneae. In three cases of ulcers corneae cum hypopio the pus quickly vanished from the anterior chamber, and healing resulted in two cases, but in the third the cornea was destroyed. In three cases of traumatic cataract massage induced resorption of cortical masses. In four cases of episcleritis the results were very good.

Fungus-Like Inflammation of the Cornea.

Markow, (Messenger of Ophthal., March-April, 1900). In a man, aet. 50, the central portion of the cornea of the left eye is occupied by a large opacity over which a fungus of a gelatinous yellowish and translucent character grows. The anterior chamber is obliterated, and there is ciliary hyperemia. Microscopic examination of the gelatinous mass shows it to be composed of the *aspergillus fumigatus*. Only a few other cases have been reported.

Pathogeny of Sympathetic Inflammation.

Selenkowsky, (Thesis, St. Petersburg, 1900). The author made a large number of experiments upon rabbits and dogs in order to test the present theories of the origin of sympathetic inflammation, and to explain the part played by toxins in such disorders. Attempts with repeated and various irritations of one eye (Graefe-Muller's hypothesis), injections into the vitreous humor of pure cultures into the general circulation, with subsequent irritation of one eye (Schmidt-Rimpf-Panas' Hypothesis), gave negative results; in no case were inflammatory changes produced in the other eye.

The result of injecting the toxin of *staphylococcus pyogenes aureus* into the vitreous and intervaginal spaces of the optic nerve were totally different:

1. Introduction of the toxin into the peripheral end of the

severed nerve forces the toxin into the eye and causes marked inflammatory changes in the anterior as well as the posterior chambers.

2. Small quantities of the toxin introduced into the subvaginal space of one optic nerve not only penetrates to the corresponding eye, but sometimes into the other; where it causes similar inflammatory changes.

3. The same toxin introduced repeatedly into the posterior half of the vitreous, sometimes passes by the subvaginal spaces of the optic nerves into the other eye and there produces inflammatory changes. These changes in both the first and the second eye in all these experiments were identical with the sympathetic inflammations of man: Iritis serosa, iritis plastica, iridocyclitis, deposits on Descemet's membrane and on the lens capsule, choroiditis and papillitis. The result of these experiments seems to show that sympathetic inflammation in man is caused through toxins formed in the injured eye, passing to the healthy eye by way of the subvaginal spaces of the optic nerve.

Expulsive Bleeding after Senile Cataract Extraction and Prophylaxis.

Lisizin, (Med. Review, April, 1900). In a female patient 70 years old three months after a combined extraction which had been done without complications, expulsive bleeding, lasting two days, occurred. Atrophy of the eyeball resulting. In the other eye the writer first made a discission and four days later simple linear extraction. Result, one month later V. = 0.1, with +13, O. D.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

By J. GUTTMANN, M. D.,

NEW YORK.

(QUARTER ENDING DECEMBER 31, 1900.)

Acute Retrobulbar Neuritis and Hysteria.

Bregman, Dr. L. E., (Wiener Medicinische Wochenschrift, October 6, 1900). The differential diagnosis between acute retrobulbar neuritis and hysteria may occasionally cause some difficulty. The central scotoma, which is characteristic of neuritis, may be missing if the disturbance of vision has advanced to total blindness. The fundus of the eye is normal in neuritis, or shows very slight changes (vascular hyperemia or anemia), secondary atrophy of the papilla is to be noticed only in the very advanced stage. The pupil is enlarged most of the time, and reacts tardily (occasionally not at all to light. Headache, pain by movement of the bulb are associated with the disturbance of vision. Chiefly responsible for this affection are cold, exertion and acute infectious diseases.

The hysteric disturbance of vision manifests itself mostly as concentric limitation of the field of vision, associated with more or less diminution of central vision, and generally affects both eyes. In some cases, however, the disturbance of vision is one-sided, and leads to complete blindness as in neuritis. The ophthalmoscopic examination of the fundus does not show any abnormality in this hysteric amaurosis; rarely it shows secondary atrophic changes. Headaches and pains in the eyes are here also sometimes associated with the disturbance of vision. Both affections, neuritis as well as hysteric amaurosis, are mostly to be found in females. The most important difference is the reaction of the pupil, besides the galvanic reaction of the optic nerve is of importance in the differential diagnosis. He now cites the following case, which illustrates the difficulty in the differential diagnosis of the two above-mentioned diseases:

Mrs. L. B., a teacher, 22 years old, called on the author November 6, 1899. The father of the patient is healthy, the mother of nervous disposition. The patient was healthy in her childhood. Five years ago she suffered from stomach

trouble and vomiting. Her disease was diagnosticated as occlusion of the intestines, for which she was operated upon. By the operation the patient was perfectly cured. Last summer the patient suffered grievances on account of large money losses of her parents, which compelled her to accept a position as a teacher in a stranger's house. Her occupation was very exerting. A week ago she began to suffer from headaches, especially on the right side of her head, and from pains in her eye. Two days later the vision of the right eye began to diminish constantly. According to her statement the acuteness of vision in looking upward was the first to diminish, and only the following day was her vision diminished in looking downward. Since last two days her power of vision in both eyes has entirely vanished. The headache has diminished, but has not ceased entirely. The right eye is painful in motion.

The objective examination showed the following results: The right eye is amaurotic. Reaction to light is absent. The vision of the left eye is normal, the field of vision is not limited, the sense for colors is normal. The examination with the stereoscope does not show binocular vision. The right pupil is much enlarged and reacts tardily to light. The ophthalmoscopic examination shows a normal condition of the interior of the eye. Examination of the galvanic reaction of the optic nerve shows the reaction very much diminished on the right side. Decided hyperaesthesia of the right side of the head and face, of the right half of the tongue, of the right shoulder and arm is to be noticed. A point very sensitive to pressure is to be found on the lower angle of the right scapula. The patellar reflex is increased. The conjunctival reflex is diminished. Occasionally the patient experiences the sensation of globus. Three weeks after the onset of the disturbance of vision the visual power returned slowly, but the eye tired very easily; at one moment the patient could see quite well, the next moment she could not see anything. The treatment consisted in administration of antipyrin, bromine, valeriana and iron pills. Since December 5th the patient was lost sight of, as she had resumed her previous position as teacher. The characteristic symptoms of the affection of the eye are similar to those of the clinical picture of neuritis retrobulbaris. The sudden loss of the power of vision, combined with headache, pain on movement of the eye, normal ophthalmoscopic picture, the tardy reaction of the pupil, all these symptoms point to a retrobulbar affection of the optic nerve. On the other hand, it is certain that this affection was caused by hysteria, as the patient had marked hysteric attacks, and numerous hysteric stigmata; hyperaesthesia of

the right half of the body, diminished reflex of the mucous membranes, globus, absence of the sense of smell on the right side, etc. In the convalescent stage the power of vision bears a direct relation to the general condition of the patient, the vision diminished during the attacks. The reaction and size of the pupil varied.

The author then dwells at length upon the theory of hysteria as to whether or not hysteria produces secondary neuritis changes in the vasomotor sphere.

Excision of the Fornix Conjunctivæ in Trachoma.

Falta, Dr. Marcel, (orvosi Hetilap, October 7, 1900). The author tried nearly all remedies, but he gives preference to the rubbing in with sublimat. Besides this he also uses the excision of the fornix conjunctivæ, but only in extreme cases. Some authors think that the utility of the excision of the fornix lies in the fact, that the scar, which is formed by the excision, forms a protecting dam, which prevents the progress of the granulositis on the bulbar conjunctiva and cornea. Dr. M. does not agree with the opinion, because the peritomy of the cornea forms in itself an ideal dam, and still does not prevent the progress or occurrence of the pannus. He considers the efficiency of this operation due to the fact that by the excision of the fornix the circulation of the blood changes and the nutrition of the tissues improves. The author is positively opposed to the excision of both fornices. He thinks that improvement of the nutrition of the tissues is to be gained sufficiently by the excision of one fornix, that is of the upper one. The granular affection of the upper lid is not only severer, as a rule, but also more dangerous, because the pannus nearly always begins from the upper margin of the cornea. The lower fornix is much easier to be treated than the upper one by mechanical and medical methods. The excision of the lower fornix is even dangerous, as the eye may then be exposed to xerosis.

The author then explains his method of operation, which is a slight modification of Prof. Kuhnt's method. He does not operate every case in the very beginning, but first tries mechanical and medical treatment, and when this is not successful he operates, especially does he follow this method in cases in which the cornea is also affected. The operation is positively contraindicated in cases where there is a tendency to shrinkage.

The Occurrence and Healing of Ablatio Retinæ.

Gabler, Dr. Ludwig, (Pester Medicinische Chirurgische Presse, November 4, 1900). The number of patients in his dispensary suffering from eye troubles in the last ten years

was 76,402, of which 120 cases = 0.5 per cent, were suffering from ablatio retinae. With few exceptions all of them were suffering a high degree of myopia. In only one case was the detachment caused by a cysticercus; in two cases by choroïditis, and in a few cases by a melanosarcoma of the choroïdea. In 69 cases the left eye was affected, in 45 cases the right eye, and in 6 cases both eyes. The distribution among the ages was the following:

Age.	Cases.	
0-10 years	—	Of the 120 patients 44 were treated for a
10-15	3	long period, 12 were treated by punctio sclerae, 11 by iridectomy, 7 by a combination
15-20	9	of both treatments. In one case tincture of
20-25	16	iodine was injected into the eyes (without
25-30	15	any result). The other cases were treated
30-35	7	with pilocarpin, iodide of potassium, and in-
35-40	16	unction. After the puncture of the sclera
40-45	14	4 cases remained unchanged, three others
45-50	8	were improved. After the iridectomy 5
50-55	11	cases were improved, 3 remained unchanged
55-60	6	and the other cases became worse. By the
60-65	9	combination of both methods (7 cases) 3
65-70	5	cases remained unchanged, one improved and the other 3 cases became worse. The internal medical treatment was in all cases without any effect.

Pathology and Therapy of *Blenorrhoea Sacci Lacrimalis*.

Fejer, Dr. Gyula, (Gyogyaszat, August 19, 1900). He considers the affection of the lacrimal sac as important not only because the affected eye is continuously swimming in pus, but also because it sometimes causes an inflammation of the neighboring connective tissues, and a slight injury of the cornea may be followed by a formation of an abscess of the cornea.

The use of probes and syringing for several months improve the condition, but does not cure the affection; and every little nasal catarrh can retard the success of the treatment. A remedy was sought, which would cause an atrophy of the mucous membrane of the lacrimal sac, and thus stop the secretion of pus. Caustic fluids were injected, but without any result.

By the systematic dilatation with Bowman's probes the stenosis can be improved, but the aspirative capacity of the unelastic wall of the lacrimal sac cannot be restored. This aspiration of the wall of the lacrimal sac is very important in the overflow of tears. Affections of the nose, catarrh, ozena, specific ulcers are often causes of the sickness, in most cases, however, nothing else can be found but a simple nasal

catarrh, hypertrophy of the turbinated bones or thickening of the mucous membrane.

The blenorrhoea sacci lacrimalis of scrofulous children, which is complicated with an affection of the bone can be cured only then, when beside the administration of general roborantia, the bone is also scraped and cleaned of the affected part, and the sac is extirpated.

In adults, especially in females, the blenorrhoea sacci lacrimalis is a frequent affection. The author accounts for this by the frequency of the different varieties of the catarrh of the nose.

Without a thorough treatment of the catarrh we can improve, but never cure the affection. The improvement is only a temporary one, as a change in the climatic conditions causes often an acute rhinitis, and by continuity a reacerbation of the inflammation of the lacrimal sac.

The routine treatment of the blenorrhoea sacci lacrimalis consists in the systematic dilatation of the stenosis in the duct and in syringing and cleaning with boric acid solution. The author could never see any good result of the forced treatment. The continuous application of a silver probe causes the patient a great deal of trouble. For that purpose he prefers the grooved probes of Landolt, through which he could inject any caustic fluid without fearing that it might enter the neighboring tissues. The author has not seen any good result from the injection of the so-much-praised protargol. If under the previously mentioned treatment no improvement is noticeable, the author considers the total extirpation indicated. As the focus of suppuration is removed, this operation is to be approved from the surgical standpoint, the tearing, however, is not improved by this operation, for this reason some oculists remove also the lacrimal gland and Abadie extirpates even the accessory gland.

In one case, Dr. F. tried probing from the nose also, but this proved to be quite difficult, as it was necessary to remove a triangular piece from the lower turbinated body. The oblique direction of the duct and the various positions of the opening also caused considerable difficulty. Concerning the blenorrhoea of the lacrimal sac of the new born, he considers it to be caused by the occlusion of the nasal ostium of the lacrimal duct. He treated and cured such cases by extirpation of the lacrimal sac, and not by probing the lacrimal duct.

Remarks on the Operation for Senile Cataract.

Fejer, Dr. Julius, (Pester Medicinisch-Chirurgische Presse, December 9, 1900). About 10 years ago the extraction of the cataract without an iridectomy was highly praised. Fuchs

was very much in favor of this procedure, and in 1890 he demonstrated many cases of this kind to his students. Mohr reported in 1890 29 cases operated by the linear extraction without an iridectomy, and showed the superiority of this method to the old Graefe's method.

Much stress was laid on the after treatment. The patient had to lie perfectly quiet. The patients very often suffering from nausea and intestinal cramps. The author even observed almost continuous vomiting, and obstruction of the bowels as a consequence of the fact, that the patient had to lie for days without any bodily motion. The nausea and vomiting was treated with internal medication, and only in very rare instances did he allow the patient to sit up, as he was always on the lookout to preserve the round pupil. The nurses had to be very well trained and reliable, and had to watch the patient continually in order that he should always lie on his back. But occasionally even with the most quiet patients the iris sometimes prolapsed, whereas in other cases the pupil remained round, even when the patient was quite restless, when he sat up or got out of the bed and removed the bandage. The prolapse was very much dreaded, not only because the healing was prolonged by this, but also because it necessitated a new surgical interference, and it might produce a cystoid scar. The cystoid scar again not only caused astigmatism, but on account of the incomplete closure of the wound the danger of a later infection was also to be feared. He therefore always watched very anxiously the progress of the healing after the operation. Prolapse of the iris he found only in 5 per cent. On his trip through the Western European cities he found, that Fuchs in Vienna tried to preserve the round pupil, but in many cases he performed an iridectomy. Schweigger and Hirschberg practiced the cataract extraction without an iridectomy. Schweigger even practiced the old Daviel-Baer method, where he made a lower flap without an excision of the iris. In his statistics he proved that by his method, an extraction of the lens by making a lower flap without an excision of the iris, he obtained a more favorable result, not only concerning the vision, but also as to the number of losses of the bulbus. The French oculists like Landolt, Wecker, Valude, Galezowski were very much in favor of the round pupil, but did not try as hard to preserve a round pupil as the Berlin school. Sattler, Hippell, Leber operated very rarely without an iridectomy. The method of Kalt to suture the corneal wound, and thus prevent the prolapse of the iris, did not find many followers. Trousseau used in his operations only one instrument: Graefe's knife. He operated without an iridectomy, in 42 per

cent of his cases he saw a prolapse of the iris. The oculists of the London Moorfield Hospital operate only with the amputation of the iris. In Budapest, Siclossy was the first who practiced the simple lineary extraction without an iridectomy, but he, as well as Schulek and Szili went back to the old method of excising the iris, as the after treatment in the simple lineary extraction requires so much more care and the patient is exposed to more accidents. The author operates also only with iridectomy, and he endeavors to excise from the iris as small a piece as possible. He allows his patients to sit up on the second day after the operation. On the second or third day he uncovers and leaves open the healthy eye. He allows the patient to lie in a large, light room, without ever darkening it. In no case did he have a prolapse of vitreous. In no case was the healing retarded by iritis. All cases healed per primam. He now gives the history and mode of operation of several cases. He sterilizes his instruments partly in absolute alcohol, partly in hot water. As a great progress in the operation for cataract he mentions the method of after treatment introduced by Hjort, who does not apply a bandage, does not allow his patients to lie in bed after the operation, the room is not darkened, and he uses only external washing of the eye. In 100 of his cases there was no suppuration, and the recovery was excellent. Czermak follows since 1893 the same procedure, but he uses Fuchs protecting shield. Blaskovics used this kind of after treatment in 1,238 cases with excellent results.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the Annals will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

At Giessen, Dr. Best is now professor.

Dr. Leopold Grossman died recently at Budapest.

Dr. V. Grosz, of Budapest, was recently made professor.

Dr. Bach, of Wurzburg, has recently been offered a professorship at Marburg.

Professor Hess and Professor Bernheimer have been awarded the Graefe prize.

Privatdocent, Dr. Addarrio, until recently in Catania, has established himself in Naples.

We are glad to congratulate Dr. Swan M. Burnett on recovery from his recent illness.

Professor Oeller, of Munich, has been appointed Professor of Ophthalmology at Erlangen.

Dr. Edward Giles has been appointed one of the surgeons at the Manhattan Eye and Ear Hospital.

At Palermo, Dr. Lodato, first assistant of Professor Angelucci, is now fully qualified as professor.

Lafayette College has conferred upon our colleague, Dr. Charles A. Oliver, an honorary degree of Master of Arts.

The well-known instructors, Dr. Konigstein and Dr. Elschmig, have been made extraordinary professors at Vienna.

At the St. Peter's Hospital, Albany, Drs. T. F. C. Van Allen and G. S. Munson have been appointed ophthalmic surgeons.

Since January, 1900, the Italian journal, *Clinica Oculistica*, has appeared monthly, under the direction of Professor Cirincione.

P. H. Mules, M. D., Edinburg, M. R. C. S. Engl., has received the appointment of ophthalmic surgeon to Wrexham Infirmary.

Dr. J. G. Huizinga, of Chicago, takes the position of collaborator on the *Annals* made vacant by the advancement of Dr. Blaauw.

At the annual meeting of the New York State Medical Association, held in October, 1900, Dr. A. A. Hubbell was elected vice-president.

In the medical department of the Western Reserve University, Dr. William E. Brunner has been made demonstrator of ophthalmology.

At the annual meeting of the directors of Mary Fletcher Hospital, Burlington, Vt., Dr. Marshall C. Twitchell was elected ophthalmic surgeon.

The Maryland Ophthalmological and Otological Society has elected Dr. Hiram Woods president, and Dr. Henry O. Reik secretary and treasurer.

Messrs. Bailliere, Tindall & Cox, of London, have lately published a practical work on Acute and Chronic Contagious Ophthalmia, by Dr. Sydney Stephenson.

Dr. Frank Stephen Milbury died at Brooklyn, August 29, 1900. He was connected with the New York Eye and Ear Infirmary and with the Bedford Hospital.

Dr. Edmond E. Blaauw, of Buffalo, N. Y., has been appointed editor for Dutch ophthalmic literature in the *Annals* in the place of Dr. Wendell Reber, resigned.

Dr. William Cheatham has recently been appointed ophthalmic surgeon, and Dr. L. Baltze, assistant to the Masonic Widows' and Orphans' Home at Louisville, Ky.

Prof. J. W. Kostenicz, of Warsaw, has been selected to fill the position formerly held by Dr. Dohnberg, in the Clinical Institute of the Grand Duchess Helene Paulowna, at St. Petersburg.

Dr. Casey A. Wood, editor of the department of Italian ophthalmic literature on the *Annals of Ophthalmology* has been elected President of the Chicago Ophthalmologic Society for 1901.

As a continuance of the well-known *Index Medicus*, during the year 1901 and thereafter will appear in Paris a complete

Bibliographica Medica. It will be under the superintendency of Baudouin, Potain and Richet.

Dr. Nelson Miles Black, of Milwaukee, collaborator to these annals, was married January 22, to Erna Leidersdorf, of Milwaukee.

Dr. Albert B. Hale has returned to Chicago from a most enjoyable trip to Venezuela, whither he went as a convalescent after an illness. Dr. Hale has regained his health completely and is enjoying his winter's work.

Another state optical society—that of Minnesota—is to make an effort to secure legislation that will give a legal standing and protection to those who practice optometry (exclusive of medical graduates).—*The Keystone.*

Rush University, of Chicago, has lately established extra-territorial relationship with the Clinical Dispensary of the United Hebrew Charities, and from its attending medical staff has appointed as Associate Clinical Professor of Ophthalmology, Dr. Albert B. Hale.

The death of Pierre Desire Lebrun took place at Brussels, August 24, 1900. He was born at Renlies in 1836. Lebrun studied medicine in Loewen and finished his education at Paris under Sichel, Chassagnac and Desmarres, in London with Bowman and Critchett.

In honor of the illustrious Pasteur, the Medical Society of Stockholm will give a gold medal every ten years. The first of the medals was awarded to Max von Pettenkofer. The rule under the award requires that the receiver of a medal must be one whose scientific work has done most in advancing bacteriology or hygiene.

A bill regulating the entrance to the medical profession has been sent by the imperial government to the Bundesrath. It prolongs the period of study to five years, enlarges the subjects upon which the examinations are based and provides for one year of practical work before a license can be granted to practice.—*Philadelphia Medical Journal.*

A Latin-American Medical Congress has lately been organized and met in Santiago de Chili the last week in December, 1900. There were five sections, viz: Internal medicine, surgery; pharmacy; natural science; hygiene and dentistry.

There were several articles presented relating to the eye, and especially its condition in subtropical countries.

The Ophthalmological and Otological Society of Washington, D. C., Dr. S. O. Ritchey, president, held its first fall meeting for 1900, October 9, at the residence of Dr. W. K. Butler, who read the paper of the evening entitled "The Necessity for Wearing Glasses," which was well received and heartily responded to by the members.—Philadelphia Medical Journal.

Dr. Jay W. Seaver, the director of the Yale gymnasium, in a physical examination of the present Freshman class of Yale University, found with regard to their eyes that only 43 per cent of the class had normal vision. Eighteen per cent were obliged to wear glasses, 18 per cent were near-sighted and 21 per cent were afflicted with either hypermetropia or astigmatism. Fifty-seven per cent, therefore, of the class had defective vision.—The Keystone.

At a meeting of the Orleans Parish Medical Society, September 22, 1900, Dr. E. W. Jones reported a case of blindness the result of drinking vinegar. The patient was a lady of thirty years, who being very stout, wishing to reduce her fat, was advised to drink vinegar, which she did, abstaining from water for three weeks; and at the end of three weeks she found herself completely blind. The eye grounds revealed only a paleness of the optic discs. Strychnia was given in increasing doses and vision has been partially restored.

It is generally believed by ophthalmologists that often when the pupils are illuminated by lights of different intensity they are approximately equal excepting in very sensitive individuals. Pick, however, has observed that in many cases of epilepsy, neurasthenia and other forms of functional psychosis, the pupils may vary considerably if the patient stands with a side toward the source of illumination, as for example, a window. Under these circumstances the pupil receiving the most light is always narrower. This seems to be due to a hyperesthesia of the centripetal apparatus.—Philadelphia Medical Journal.

Dr. Leopold Javal, the eminent ophthalmologist, has recently been made an officer of the Legion of Honor. Dr. Javal recently lost his sight from glaucoma. He began his professional life as a mining engineer, but while translating

Helmholtz's Physiological Optics, he became fascinated with medicine and took up its study, and afterwards devoted himself to ophthalmology. He was at one time a member of the Chamber of Deputies, and while serving as such he was the means of passing the "Seven Children Law," which exempts from taxation the parents of families of not less than that number. A large portion of his time is now given to the improvement of the means for enabling the blind to read and write.

At a meeting of the Philadelphia Pathological Society, November 22, 1900, Drs. George E. De Schweinitz and E. A. Shumway made a report upon two cases of retinal glioma. In the first case, the posterior portion of the eye was occupied by a grayish mass, which has also invaded the optic nerve. Some portions of the mass included lime salts. Many cells could not be stained. There was thickening and hyaline degeneration of the vessels. The Wintersteiner rosette formations could not be discovered. In the second case, that of a boy, the grayish masses filled the anterior chamber, and as in the first case, a portion of the cells did not take the stain (eosin and hematoxylin). In this case, also, rosette formation could not be found. Virchow still adheres to the theory of the neuroglia origin of this neoplasm, but Wintersteiner puts stress on the rosette formation, designating the growth as neuroepithelioma of the retina.

The third Pan-American Medical Congress will convene at Havana, February 4, and continue in session till February 7. The officers of the ophthalmic section are: Dr. Enrique Lopez, president; Dr. John E. Weeks, secretary. The address of the latter is 40 East Fifty-seventh street, New York City. An entertainment committee has been appointed by the City Council of Havana, and that committee has arranged a program which, it is believed, will add to the pleasantness of the meeting. Among other functions, a large ball will be given at the Tacon Theater, under the control of a sub-committee of ladies. A banquet will be given, also at the Tacon Theater. Another attractive feature will be an excursion to the sugar plantation of Mr. La Costo, near Havana. Three transports will convey the delegates thither, and the guests will be shown the manner of cultivating the cane, of grinding it and all the various steps in the production of sugar from the cane. There will also be a number of entertainments given by Cuban physicians. The scientific program will, it is believed, excel that of any previous Pan-American Congress.

Dr. H. L. E. Johnson, Washington, D. C., is chairman of the transportation committee.

At the regular meeting of the Buffalo Academy of Medicine, Section of Ophthalmology, etc., September 17, Dr. A. L. Benedict read a paper entitled "Eye-strain or Gastric Reflex," in which he contended that too large an importance was attached to eye-strain as a causative factor in the production of abnormal conditions, it being rather the result of these conditions. He believes that gastric disturbances are usually at the bottom of those conditions laid at the door of eye-strain. In discussion, Dr. C. G. Stockton could not at all agree with the position taken, as his experience proved conclusively that eye-strain is repeatedly the cause of pathologic states and many times inducing disturbances of digestion which would produce the symptoms. Dr. A. A. Jones differed with the speaker, contending that while gastric reflex is an extremely important factor and may bear either the relation of the cause or the effect to eye-strain, eye-strain is very often the primary cause. Drs. E. Starr, A. G. Bennett and A. A. Hubbel said that their experience in the correction of errors of the eye as treatment for diverse pathologic conditions leads them to the conclusion that eye-strain is often the sole cause of these conditions.—Philadelphia Medical Journal.

It was in the year 1754, says the Berlin correspondent of the London Lancet, that the degree of M. D. was first conferred on a woman in Germany. The Vossische Zeitung of July 18, 1754, mentions that the medical faculty of the University of Halle had granted the degree of M. D. to Mrs. Dorothea Christiana Erxleben, after she had passed the examination with distinction. The title of her dissertation which, according to the custom of that time, was written in Latin, was "*Quod nimis cito et jucunde curare saepe fiat causa nimis tutae curationis.*" This lady had been an apprentice of her father, a well-known medical practitioner at Quedlinburg, and as she could not matriculate at a university, she learned medicine by reading only. By a royal decree of Frederick the Great, she was then recommended to the faculty of Halle as a candidate for graduation, but she presented herself only after the death of her husband. She also published an essay on the utility of learning for the female sex.—New York Medical Record.

It is with regret that we announce the death of Dr. Osio, of Madrid. He was born at Caracas in October, 1840, and graduated in 1865. Afterwards he attended the clinics of

Sichel, Desmarres, Wecker, Galezowski, in Paris; Critchett, in London; Graefe and Hirschberg, in Berlin; Von Magnus, in Breslau; and Arlt and Fuchs, in Vienna. In 1869 he established himself in Barcelona as an oculist, and here he manifested his scholarly and scientific attainments as a fellow worker on the *Independencia Medica*, and also as the organizer of the *Revista de Ciencias Medicas*, as well as the Hospital del Sagrado Corazon, which latter was the first institution to make possible the study of our specialty in Spanish infirmaries, and where that excellent surgeon, Dr. Cardenal, has continued the work. Here Osio began his lectures in ophthalmology, which he continued as a member of the Medical Faculty in Barcelona. In 1881 he moved to Madrid, where he displayed the same untiring activity. As a warm friend of the people, he wrote the little book on *L'Oftalmia Purulenta del Recien Nascido* (Madrid, 1886). He translated Mooren's work, *Relacion Entre Padecimientos Uterinos y Las Afeciones de Los Ojos* (Madrid, 1884). Although he was ill for several years, he stayed at his post like a true soldier until his death on July 21, 1900. (*Centralblatt f. Praktische Augenheilkunde*.)

An ophthalmologic light is apparently beginning to break upon the English profession. While a number of American oculists are guilty of ignoring and belittling the very thing of which they should be proudest, and wearily continue to grind out the wheezy monotone of endless papers on operations and inflammatory diseases, the president of the Section on Ophthalmology of the British Medical Association devotes his presidential address to the all-important subject of refraction and ocular headache. We hope that his bravery may hereafter encourage our ophthalmologists to devote at least one paper in forty to subjects constituting nine-tenths of their daily practice, and that the operative mania may in the next one or two hundred years be relegated to its proper scientific place. Dr. Brailey should be heartily congratulated by discerning American oculists, although he is compelled to throw the inevitable sop to the conservative Cerberus by saying (what is not true) that "the great majority of headaches are, of course, independent of the eyes." We can also smile as cynically as the lecturer when he tails up with the charming astigmatic glance at "the citizens of the United States, who are eminently affected by ocular errors, so that a series of doctors and operators has arisen to take charge of that special subsection of practice." What a picture is incidentally

drawn in the histories of some of his cases—for instance, in that of the poor woman with only a slight exophoria who, during twenty years, had been ordered eighteen changes of glasses by her London ophthalmologist, who each time increased her “supporting” prisms bases in. Her disease was a slight hyperphoria! Although the increase of adduction by prism-gymnastics and many other things routine in American practice have not been able to cross the Atlantic, we are too glad of the dawning to criticize the clouds that temporarily, we hope, obscure the sun.—Philadelphia Medical Journal.

The British Medical Journal of June 17 says: Professor Gustavo Pisenti, of the University of Perugia, has lately had a thrilling experience in extracting a cataract from a powerful lioness about three years old. The animal was placed in a suitable cage in the middle of the menagerie, and the first difficulty was the administration of an anesthetic. The intervals between the bars of the cage were filled up with cotton wool, and a large packet of gauze impregnated with chloroform was placed in the cage, the door of which was then closed with a shutter. In about a quarter of an hour a reconnaissance was cautiously made, and the illustrious patient was seen lying stretched out, apparently in condition of deep coma. She was then dragged out of the cage, bound and gagged. She was next placed on a table, but before the operation could be begun she suddenly awoke, and struggled violently, rolling on to the floor, where the medical men, “with admirable coolness, but not without intense emotion which might easily be seen in their countenances,” held her down while the animal’s head was wrapped in a towel steeped in sulphuric ether. The lioness, however, managed to free herself from the gag, and partly from her bonds, and gave a roar which made the majority of the spectators beat a hasty retreat. But the ether overcame her, and Professor Pisenti with great pluck dragged her into the cage again, where the anesthetic coup de grace was given by means of another packet of gauze steeped in chloroform. The beast’s head was pulled out through the door of the cage and securely held in position. Professor Pisenti then operated with brilliant success. We have no doubt that the professor had a more “serious time” than Artemus Ward had in getting into the uniform of the days of his youth, and we congratulate him heartily on having escaped a counter-operation by his formidable patient. A curious feature of the scene was the excitement produced among the other animals—zebras, bisons, leopards,

wolves, hyenas, monkeys, etc.—in the menagerie who all inhaled some portion of the anesthetics with which the air was saturated.—*Ophthalmic Record*.

Among other papers read before the Ophthalmological Society of Heidelberg, September 13, 14 and 15, 1900, were the following:

Cysts of the Iris, with Demonstrations—Dr. Wintersteiner, of Vienna.

The Treatment of Glaucoma by the Removal of the Superior Sympathetic Ganglion of the Neck—Dr. Grunert, of Tübingen.

Optic Neuritis from Infectious Diseases—Professor Utthoff, of Breslau.

Conjunctivitis Necroticans—Dr. Praun, of Darmstadt.

1. On the Rudimentary Eye of the European Blind Mouse. 2. Microscopic Demonstrations.

Paresis of Divergence—Dr. Bielschowsky, of Leipsic; from an investigation with Dr. T. B. Hoffman, assistant in the Physiological Institute.

On Luxation of the Lens—Professor Schmidt-Rimpler, Göttingen.

1. Binocular Vision. 2. Demonstrations Especially in Hydrophthalmus and Myopia—Dr. Heine, Breslau.

On Choroiditis Exudativa—Dr. Schick, of Halle.

On the Effect of the Suprarenal Extract on the Eye—Dr. Wessely, of Heidelberg.

An Electric Skiascope—Dr. Wolff, of Berlin.

1. On the Fluorescin Method in Its Application to Endothelial Diseases of the Cornea. 2. Congenital Hydrophthalmus—Professor von Hippel, Heidelberg.

On the Open Treatment Following Operations on the Eye, Especially after Cataract Operation—Professor Sattler, Leipsic.

The Pathogenesis of Methyl-Alcohol-Amblyopia, with Demonstrations of Microscopical Preparations—Dr. A. Birch-Hirschfeld, Leipsic.

The Limit of Visual Acuity—Dr. Best, of Giessen.

On Central and Peripheral Acuteness of Vision—Dr. Hummelshelm, of Bonn.

Demonstrations of Preparations from Cases of Sympathetic Ophthalmia—Professor Schirmer, of Greifswald.

Retinal Lesions Caused by Arteriosclerosis—Dr. Hertel, of Jena.

Fatigue of the Visual Field—Professor Reuss, of Vienna.

A symposium of the Chicago Ophthalmological and Otolological Society with the Chicago Medico-Legal Society was held Tuesday, February 12, 1901.

The subject discussed was "the Medico-Legal Relations of Ocular Diseases and Injuries."

"The Legal Basis of Compensation in Injuries of the Eye," by Joseph E. Gary, Judge of the Superior Court. For injuries inflicted through negligence only—without malice—compensation is the rule at law. Compensation includes not only pecuniary loss, but also physical and mental pain, impaired enjoyment of life, and probable prospects. This rule is uncertain in application because juries have no guide as to loss, other than pecuniary, except their own judgment. In cases of injury through malice other factors enter into estimate.

"The Economic Valuation of Vision," by H. V. Wurdemann, M. D., of Milwaukee.—The earning ability of a bodily function is the only fixed economic factor—visual earning ability can be exactly estimated and is synonymous with full earning ability—formulae for full and visual earning ability—factors are central visual acuity, visual field, ocular musculature and ability to compete—economic and scientific standards for vision—economic limitations of trades—working formulae, tables and diagrams for mathematical calculation—loss of vision in different forms and estimation of its effect on the earning powers of the individual—pecuniary loss dependent on the lessened visual powers, the business and the age of the individual—the economic damage should be made the basis for indemnity—examples.

"Nervous Affections of the Eye Caused by Accident," by T. Patrick, M. D.—Organic and functional; the latter mostly more frequent. Justice of compensation for same. Most common complaints, their nature, evolution, detection and prognosis. Subjective symptoms and objective signs. Difficulty of distinguishing hysteria, exaggeration and simulation. "Damage Suits from the Standpoint of the Ophthalmologist," by Dr. F. C. Hotz.—Different valuations people put upon the lost eye. Motives for suits. What physicians and lawyers can do to prevent suits of this kind.

Dr. E. T. Snyder exhibited some specimens.

Dr. C. D. Wescott reported a case of sarcoma of the coroid.

Dr. Brown Pusey exhibited some specimens and also a new ophthalmoscope.

Dr. Hotz reported on camphoroxol and menthoxol in ear diseases.

The sixth annual meeting of the Western Ophthalmological and Oto-Laryngologic Association will be held at Cincinnati

April 11-12, 1901. Dr. M. A. Goldstein, of St. Louis, is President; Dr. H. V. Wurdemann is Vice-President, and Dr. William L. Ballenger, 100 State street, Chicago, is Secretary. The following is the preliminary program:

1. Dr. J. H. Johnson Kansas City, Mo.
Paralysis of the Accommodation Following Diphtheria.
2. Dr. John J. Kyle Indianapolis, Ind.
Obstruction of the Lachrimal Duct and Its Treatment.
3. Dr. Norval H. Pierce Chicago, Ill.
Treatment of Some Purulent Conditions of the Antrum of Highmore Through the Natural Opening.
4. Dr. A. H. Andrews Chicago, Ill.
The Abortive Treatment of Otitis Media.
5. Dr. F. A. Phillips Chicago, Ill.
Hysterical Disorders of the Eye.
6. Dr. J. S. Mott Kansas City, Mo.
Wounds of the Cilliary Body and Their Treatment.
7. Dr. George F. Keiper Lafayette, Ind.
Subject to Be Announced Later.
8. Dr. J. O. Stillson Indianapolis, Ind.
Resection of the Supra-Orbital Nerve.
9. Dr. Horace Heath Veedersburg, Ind.
Cautery Dissection of the Tonsils.
10. Dr. M. F. Weyman St. Joseph, Mo.
The Relation of Chalazion, Internal Styas and Tarsadenitis.
11. Dr. Ellet O. Sisson Keokuk, Io.
Report of a Case of Contused Wound of the Eyebrow Followed by Marked Visual Disturbances.
12. Dr. Hal Foster Kansas City, Mo.
The Cause and Treatment of Laryngeal Edema.
13. Dr. A. R. Amos Des Moines, Io.
Subject to Be Announced.
14. Dr. Edwin Pynchon Chicago, Ill.
Subject to Be Announced.
15. Dr. J. G. Hallinger Chicago, Ill.
Spongification of the Bony Capsule.
16. Dr. J. G. Huizinga Chicago, Ill.
A New Cataract Operation.
17. Dr. W. L. Beardsley St. Louis, Mo.
Subject to Be Announced.
18. Dr. J. W. May Kansas City, Mo.
Subject to Be Announced.
19. Dr. W. Scheppegrell New Orleans, La.
Subject to Be Announced.
20. Dr. Frances Dickinson Chicago, Ill.
Drainage of the Eye As a Basis of Treatment.
21. Dr. B. E. Fryer Kansas City, Mo.
Subject to Be Announced.

22. Dr. H. W. Loeb St. Louis, Mo.
 A Means of Reducing an Overgrowth of the Intermaxillary
 Frenum, Permitting the Retention of Two Central Incisors
 in Close Apposition.
23. Dr. Dudley S. Reynolds Louisville, Ky.
 Therapeutic Value of Adrenalin.

Dr. Jokichi Takamine, of the scientific staff of Parke, Davis & Co., has isolated the active principle of the suprarenal gland, to which the name of adrenalin has been given. The firm has now under way a process for producing this active principle on a large commercial scale, but the supplies are not yet ready for the market, although small quantities have been supplied to a number of scientific investigators for trial and experimentation. The clinical uses of the powdered suprarenal gland and of the preparation made therefrom have appealed very strongly to physicians for the treatment of eye, ear, nose and throat diseases. The active principle, adrenalin, is in white crystalline form, and its general chemical behavior is that of a basic substance; it is barely soluble in water—one part in about 600 parts of water; it dissolves readily in dilute acids forming various salts; its solutions exhibit all the characteristics, chemical and physiologic reactions, of the active principle of the gland. The adrenalin chloride is more soluble. One drop of the 1-10,000 solution introduced into the eye will blanch the lids within 30 seconds to one minute; five drops of the 1-1000 solution used by the mouth is a strong heart stimulant and will stimulate the pulse during surgical operations under chloroform. Dr. Wurdemann, of Milwaukee, has given an exhaustive trial to this new addition to our therapy. It has been used for a considerable number of squint operations, operations on the conjunctiva, glaucoma and other operations upon the eyeball, which were thus rendered bloodless. Excision of the inferior turbinal body, removal of spurs from and replacement of the septum, polypi; in fact, practically all nasal operations can be bloodlessly done by the use of the adrenalin chlorid in 1-5,000 of normal salt solution; which combination seems to be the most generally applicable. It is a useful adjunct for preparation of the nasal membrane for galvano-cautery operations. In the case of acute inflammations of the conjunctiva and of the nasal membrane, its action, after the use of cocaine, is extremely favorable, as for the space of an hour or longer it blanches the inflamed membrane and thus reduces the inflammation; the reaction seems to be less than the original astringent and hemostatic action, and it being apparently non-poisonous (so far there having been no deleterious effects).

topical applications may be made over and over again. Thus in a number of cases of acute catarrhal inflammation of the frontal, ethmoidal and maxillary sinuses, in Wurdemann's practice, application of this solution to the nasal membrane has allowed of washing out these cavities and securing proper drainage without necessity of proceeding to operation. The action of the adrenalin chloride is much the same as that of the crude powdered gland, but its advantages are that it seems to be more powerful, has no special reaction and is an antiseptic preparation; it seems to possess no anesthetic power in itself, but prolongs the duration of the anesthesia already achieved by the use of holocain, cocain and other anesthetics. Parke, Davis & Co. are putting a solution on the market which contains 1-1,000 of the adrenalin chloride in normal salt solution containing 5 per cent chloretone. This seems to be a happy combination. In our abstracts of German ophthalmic literature there will be found an abstract of an article on "Atrabilin," which, perhaps, may prove to be the same or similar to the active principle discovered by Dr. Takamine.

Lay Management of Medical Institutions.

It is a common practice of politicians, and sometimes also of lay professional philanthropists and others, to charge physicians with a lack of business or so-called executive ability, and to therefore insist upon lay management of medical institutions. It is very exceptionally the case that facts justify this assumption, while a very large number of cases can be cited where lay management is unbusinesslike and even disastrous. The needs of a medical establishment, and especially of a hospital, can only be fully appreciated by a medically-educated man, and it often happens that while finances may be economically administered, the real purpose of the charity is to a greater or less extent frustrated by the ignorance or obstinacy of its lay administrators. Even this judicious management of funds is not the universal rule and the worst financial scandals occur under just such conditions. The Medical Press and Circular editorially mentions an instance of fatuous financing of a public charity by lay managers that strikingly illustrates this point. The oldest and best known ophthalmologic hospital in Great Britain, until recently occupied freehold premises of immense and increasing value. On the plea that they were inadequate the committee sold the premises, transferring the hospital to grounds involving a yearly rental of thousands of dollars and heavy taxes. Then they sank the amount derived from the sale of their old site in their new building and deprived the hospital of apparently its only

permanent asset. It is said, moreover, that the charities commissioners will require that the value of the site be made up within a definite period, thus making an additional charge upon the hospital. Altogether it appears to be about as bad a piece of financing a trust as can well be imagined, but it is not without its counterparts. Medical administrators may have their faults, but they could hardly be worse than their lay confreres; they have, moreover, what the others lack, a professional interest in their charge, and we believe, also, as a rule a feeling of professional honor, which is a better insurance of honest administration than much of the average business principles extant. It may be that sometimes these latter, as our English contemporary strongly hints, are not used to the best advantage of medical trusts confided to the care of business men.—*Jour. A. M. A.*, Jan. 5, 1901.

A Degree for "Optical" Graduates.

The New England Optical Institute has taken the necessary legal steps to legalize the degrees given by it, and the following notice has appeared in a number of papers in New England:

We, William A. Earle, M. D., president, and Charles D. Tucker, secretary, respectively, of the New England Optical Institute hereby give notice that, in accordance with chapter 381 of the acts of the year 1896, we intend to present to the General Court of Massachusetts, of the year 1901, the following petition: To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in general court assembled—The undersigned petitioners, citizens of Massachusetts, respectfully petition your honorable bodies for such legislation as will empower the New England Optical Institute, a corporation duly established December 20, 1898, according to the requirements of the fourth section of chapter one hundred and fifteen of the Public Statutes of the Commonwealth of Massachusetts, and acts in amendment thereof and in addition thereto, to grant a legal degree of Doctor of Physiological Optics (D. P. O.) and also a degree of Bachelor of Optics (B. O.) to students of said Institute who have completed the required attendance and passed satisfactorily all the required examinations, and who furnish certificates that they are twenty-one years of age and of good moral character.—*The Optical Journal*, Dec., 1900.

OBITUARY.

HENRY DRURY NOYES, M. D., NEW YORK.

Dr. Henry D. Noyes died at his summer home in Mount Washington, Mass., on November 12, at the age of sixty-eight years. The cause of his death was pneumonia. He was born in this city and was educated at the New York University, from which he was graduated with the degree of A. B. in 1851. He was graduated in medicine from the College of Physicians and Surgeons in the class of 1855, and after serving on the house staff of the New York Hospital went abroad to continue his studies. Upon returning to this city he entered upon a special practice in diseases of the eye and ear, in which he achieved great distinction. His contributions to periodical medical literature were numerous and valuable, and he also published a treatise on the diseases of the eye. He was among the first to recognize the immense importance of cocain as a local anesthetic in operations upon the eye, and his letters on this subject to the Medical Record went far to establish the value of Koller's discovery and to popularize it in this country. He was for many years professor of ophthalmology and otology in the Bellevue Hospital Medical College, and was also executive surgeon to the New York Eye and Ear Infirmary. He was a member of numerous special and general medical societies and social organizations. A widow and three children survive him.

Dr. Noyes was the type of the progressive specialist, as during his whole professional life he adhered strictly and solely to perfecting himself in his particular branch of work. Combining the rare qualities of skill, sound judgment and broad conservatism, he was ever a sound counsellor and one always to be trusted in the management of the gravest and most responsible cases. Having a finished and terse literary style, and being an eloquent and forcible speaker, he always impressed his colleagues as a born leader and a clear thinker. To the very last he was active in his work as a teacher, writer and lecturer, proving that a sound constitution, a clear brain and a steady hand are the legitimate rewards of a well-ordered and consistent life.—New York Medical Record.

BOOK NOTICES.

Ophthalmic Lenses.

Ophthalmic Lenses; Dioptric Formulae for Combined Cylindrical Lenses, the Prism-Dioptry and Other Optical Papers, With One Hundred and Ten Original Diagrams, by Charles F. Prentice, M. E., (Published by the Keystone, the organ of the Jewelry and Optical Trades, 19th and Brown Sts., Philadelphia, 1900. Price, \$1.50.)

This book is a revised edition of the author's original papers, combined for the first time in one volume, and is a compendium of the various laws of physics relative to the subject. It is illustrated with 110 diagrams, and the text is largely confined to a description of these diagrams, by the aid of which, the optical principles are presented in their natural order. Considering the complexity of the subject, the author has handled it in a comparatively simple manner, so that any one who is competent to practice the art of measuring the ocular refraction should be able to readily follow the author's line of thought.

The Ms. on prisms and ophthalmic lenses were reviewed by Dr. Swan M. Burnett and the latter's models demonstrative of cylindric refraction have been further elaborated and completed by the author. Prentice's papers on the prism dioptry are classic. He gives a description of his prismometer, and there are other articles on the prismometric scale, on the practical execution of ophthalmic prescriptions involving prisms, on cemented bifocal lenses, reasons for non-neutralization of strong contrageneric lenses, the advantages of the spherotoric lens, the iris as a diaphragm and photostat, the correction of presbyopia, which he calls "depleted dynamic refraction," and other shorter papers. Every one whose occupation involves the adaptation of glasses to the eyes of others, should feel it a duty to himself to not alone possess, but endeavor to read understandingly the papers. In their revised form with the addition of recent research, these standard papers are of increased value and combined in one volume, they make a compilation of the subject which is otherwise only to be found in scattered treatises. H. V. Wurdemann.

Diseases of the Eye.

Diseases of the Eye. By Edward Nettleship, F. R. C. S., Ophthalmic Surgeon at St. Thomas' Hospital, London, Sur-

geon to the Royal London (Moorfields) Ophthalmic Hospital. New (6th) American, from the sixth English edition, thoroughly revised by William Campbell Posey, A. B., M. D., assistant surgeon to the Wills Eye Hospital, Philadelphia. With a supplement on the Detection of Color Blindness and Tests for Acuity of Vision and Hearing, by William Thomson, M. D., Professor of Ophthalmology in the Jefferson Medical College, Philadelphia. In one 12mo. volume of 560 pages, with 192 engravings, selections from Snellen's test-types and formulae, and five colored plates. Published by Lea Bros. & Co., Philadelphia and New York, 1900. Cloth, \$2.25 net.

This little volume is so well known to ophthalmologists that it hardly needs being again brought to the notice of the ophthalmic surgeons of the United States, further, than to call attention to the fact of its being a new edition of a work, from the hands of the eminent surgeon Nettleship; and also that it has been revised and re-edited to meet the needs of the American ophthalmic surgeon whose modes of procedure are, to a large extent, different from his English brother, especially as regards ocular therapeutics and the laws governing the visual tests for admission into the Army, Navy and Marine Service and Public Service of the United States. The method of examination of the eyes of school children is also taken up.

Dr. Posey has introduced the latest views regarding the bacteriological origin of conjunctivitis, and descriptions of several new forms of ocular diseases. This makes it a thoroughly and typically American text-book of up-to-date ideas.

Nelson M. Black.

Physicians' Visiting List.

Physicians' Visiting List (Lindsay & Blakiston's) for 1901, 50th Year of its publication, Philadelphia, P. Blakiston's Son & Co. Price, \$1.

This little book makes its annual call and must be welcome to all those who try to establish system and method in their professional book-keeping. In addition to the ordinary blank page ruled for daily entry, there are in the front part of the book, various details for ready reference and a modern dose list.

This Visiting List adapts itself very readily, not only for the physician, who is making daily visits, but even for him whose practice consists largely of office consultations. As in all visiting lists, there are various sizes published, so that the man of small or large practice can be easily suited. It certainly can be commended to every physician for the simplicity of its pages and the neatness of its construction.

A. B. Hale.

Hand-Book of the Diseases of the Eye and Their Treatment.

By Henry R. Swanzy, A. M., M. B., F. R. C. S. I., Examiner in Ophthalmology to the University of Dublin; Surgeon to the National Eye and Ear Infirmary and Ophthalmic Surgeon to the Adelaide Hospital, Dublin; seventh edition; 165 illustrations. Philadelphia, 1900. \$2.50 net.

Swanzy's book has again been republished in America, and in comparing it with the edition of 1896, it is evident that many important changes have been made. The number of illustrations is actually less, but this is easily explained in looking at the text by the fact that there have been omitted the introductory paragraphs on Elementary Optics. In many ways this is an advantage, for, as the author says in his preface, "it may be reasonably expected that the student will bring to the study of eye diseases an acquaintance with optical laws which is required for the proper understanding of refraction and of the theory of the ophthalmoscope;" and I may add that no student ought to be satisfied with such elementary optics as is found in the usual text-book, but should resort either to a text-book of physics, where he gets optics in the purer form or to some text book dealing with the mathematical side of the question, if he wishes to develop his knowledge of optics still further.

Besides this change, the present edition has extensive additions in reference to the use of the various methods such as the X-ray for the diagnosis of foreign bodies within the eyeball and for the use of the various magnets advocated to extract them. This occurs in the chapter on the Vitreous Humor, and is well worth reading by itself, although I should think an American editor might have given credit to Dr. Sweet and the Philadelphia School for their exhaustive research in the localization of foreign bodies by means of the X-ray.

Another change worth noting is found in the chapters dealing with the relation of General Diseases to those of the Eye, and especially with brain symptoms, as manifested in the eye itself. These are thoroughly up-to-date, and comprise certain diagnostic methods which have hitherto been neglected in the usual text-book.

It is, perhaps, worthy of note, that Swanzy in his methods leans more to the German School than to English. His references are often to German sources, and consequently if the book is the only one which the student possesses it has the advantage of combining the English and the German characteristics, while if the student is not limited to one language and yet wishes a larger library, Swanzy could well be used to represent the German, and such a book as Nettleship's be used to represent the English school.

Another improvement is found in the paragraph condensing in tabular form the uses and effects of the various mydriatics and myotics (pp. 322 to 326). It is so recent as to include in detail scopolamin, euphthalmin and even holocain. It is hardly possible to offer any adverse criticism on such an attractive book as Swanzy's, and yet we hope that future editions may be improved by substituting descriptions of American mechanical devices (in the ophthalmometer, for instance) which are really better than many such instruments found in England or Germany.

The mechanical construction of the book, as in everything from the house of Blakiston is commendable, and if for no other reason, the price ought to make the book a popular one, especially for the undergraduate student. A. B. Hale.

Refraction and How to Refract.

Thorington: Refraction and How to Refract. Including section on Optics, Retinoscopy, the Fitting of Spectacles and Eye-Glasses, etc., by James Thorington, A. M., M. D., Adjunct Professor of Ophthalmology in the Philadelphia Polyclinic and College for Graduates in Medicine; Assistant Surgeon at Wills' Eye Hospital. Two hundred illustrations, thirteen of which are colored. Octavo. 301 pp. \$1.50 net, cloth. P. Blakiston's Son & Co., 1012 Walnut street, Philadelphia, Pa., Second edition 1900.

It is gratifying to me to note that Thorington's book has already reached its second edition, because I remarked in reviewing the first edition that the book covered satisfactorily and completely the questions of refraction which the student is most apt to ask himself, without entering upon the technical or mathematical side of optics; it is clear enough even for the practitioner who wishes a thorough handbook for his daily work. I notice that the few errors, unavoidable, perhaps, in a first edition, have been corrected, and yet there is hardly enough new matter or change of old matter otherwise to demand extensive comment. The book is thoroughly up to date and worthy a place in any library.

A. B. Hale.

Sympathetic Ophthalmia.

Schirmer, O., Dr., Professor, Greifswald, Graefe-Saemisch, *Handbuch der gesamten Augenheilkunde*, 2d edition, entirely newly written, chapter viii. of volume vi., Nos. 22, 24, 25, Leipzig, 1900, W. Engelmann. (Subscription price 6 m., \$1.50).

It is a valuable feature of the great handbook of Graefe-Saemisch that each chapter is entrusted to an author who, by

previous works, has shown his thorough knowledge in particular field. Thus no better introduction of the work of this chapter could be thought of than Schirmer's admirable paper on sympathetic ophthalmia in von Graefe's *Handb.* Vol. 38. Whereas in the first edition of Graefe-Saenger sympathetic ophthalmia was dealt with only on a few pages under the heading of diseases of the uveal tract, we here find an entirely new work of 212 pages, with a colored plate, illustrating sympathetic neuro-retinitis and choroiditis. S. discusses the essential difference between sympathetic ophthalmia and sympathetic irritation and devotes 36 pages to the latter.

It consists of an abnormal irritability, similar to the general weakness in neurasthenia and hysteria, but more intense, with impaired function, of all centrifugal and centripetal nerves of the eye, primarily diseased, and ceases with the subsidence of the latter. The clinical picture is demonstrated by the symptoms of sympathetic irritation of the sensitive and motor (centripetal), the motor and secretory apparatus (centrifugal), and the sympathetic nervous system. The most important symptom of sympathetic irritation of the sensory apparatus, which may show impaired function or increased irritation, is the sympathetic amblyopia, not to be confounded with the more frequent sympathetic asthenopia, i. e., diminution of endurance of the eye for work (interrupted vision). Out of 100 tabulated cases from literature only 25 belong here, i. e., cases of impaired central vision, without objective changes of the eye, caused by irritation of the other eye and disappearing with the latter. Sensory symptoms of increased irritation are photophobia and photopsia, which, in a case of S., appear as dark spots of the size of pin heads, crawling like ants in the whole visual field. Paresis of accommodation or diminution of endurance of the latter, less frequently spasm of the ciliary muscle, spastic miosis, clonic and tonic spasms of the ciliary muscle indicate sympathetic irritation of the motor apparatus. While lacrimation is one of the most common symptoms of sympathetic secretory irritation, S. denies the occurrence of sympathetic glaucoma in the strict sense of the word. But, if an eye is predisposed to glaucoma, irritation from the other eye, may accelerate its outbreak or influence its course unfavorably. Therefore, in all cases of glaucoma of one eye enucleation of its blind irritated or painful eye is indicated. Various diseases of the eye may produce sympathetic irritation by affecting the ciliary nerves; inflammation, lacrimation and injection. Sympathetic irritation is a stage or lesser degree of sympathetic inflammation, since a number of diseases may create sympathetic irritation. Sympathetic irritation never cause sympathetic inflammation. Intense irri-

tation may exist for a long time without ever ending in inflammation. Sympathetic inflammation may be preceded by sympathetic irritation, but was not in quite a number of well observed cases. S. considers optico-ciliary neurotomy of the amaurotic eye as the standard operation in sympathetic irritation, entering between inferior and internal rectus with out detaching a muscle. If the exciting eye shows symptoms of inflammation, and thus may create sympathetic ophthalmia, enucleation has to be performed. A satisfactory explanation of sympathetic irritation cannot be given, probably it is due to a disturbance of the cerebral centres, and not to a peripheral lesion.

Sympathetic ophthalmia does not represent a typical clinical picture. It is always a diagnosis of probability, since it is characterized only by the peculiar manner of its origin. It is also very difficult to give statistics of the frequency of sympathetic ophthalmia, as it does not appear in most clinical reports under a special heading. S. calculates from the material of Mooren and O. Becker 0.13 to 0.15 per cent. For the diagnosis we must know which diseases may cause sympathetic ophthalmia, after how long a time, and what clinical aspects it may present. The most frequent causes are perforating injuries of the other eye, which do not heal smoothly, but are followed by inflammations of the uvea of longer duration, from invasion of bacteria. Inflammation of the uveal tract from chemical irritation by aseptic foreign bodies never causes sympathetic ophthalmia. It may occur, but less frequently, in purulent inflammation of the uveal tract, and then generally in the milder forms. Glaucoma, herpes zoster, symblepharon have to be excluded. Operations opening the eyeball, intraocular tumors, intraocular cysticercus, subconjunctival ruptures of the globe, gonorrhoeic infections, tuberculosis, lepra only may lead to sympathetic ophthalmia, if complicated by uveitis from bacterial infection. It must be left undecided, whether spontaneous or idiopathic inflammation, in which the phlogogenic agent enters the eye through blood or lymph circulation, may create sympathetic ophthalmia.

The minimal interval between the disease of the first and second eyes, which has been observed with certainty, is 14 days, the maximal may amount to years even decennia. But then always recent inflammations were found in the exciting eye, which generally was phthisical, either by a new infection or by revival of bacteria which had entered the eye at the time of injury and were inactive. Also phthisical eyes with ossification only cause sympathetic ophthalmia under this condition.

Fibrinous uveitis is the most common and the most severe form of sympathetic inflammation. There are no prodromal signs. Irritation may precede the inflammation, but they are prodromes but a complication. The first symptom is intense ciliary injection, followed by deposits on Descemet's membrane. The ophthalmoscope frequently reveals inflammatory changes at the optic disk and faint opacities of the vitreous.

Posterior synechiae, profuse fibrinous exudation in the anterior chamber and between ciliary body and lens, adhesions of the whole posterior surface of the iris, with following contraction of the periphery of the iris, represent the ominous aspect of this affection. Other cases take a more favorable course, but, on account of the tendency to relapses, the eye cannot be considered as saved, unless it remains free from further inflammations for a year. All parts of the uvea, iris, ciliary body and choroid, are affected in sympathetic ophthalmia, although they may be attacked in different order, either first in front or from behind. The first changes, which may be diagnosed clinically, are generally found in the iris. Serous uveitis is a lighter form of sympathetic ophthalmia. It has the same etiology, but we have no conception, why in the one case fibrinous, in the other serous uveitis sets in.

Papillitis and retinitis are a frequent complication of sympathetic uveitis; but the former may occur without affection of the uvea. S. reports seventeen cases so far known in tabular form. It originates in traumatic infectious uveitis of the first eye, just as sympathetic uveitis, but its further course differs from the latter in every point, and resembles very much sympathetic irritation. It subsides promptly after enucleation of the exciting eye. Therefore S. assumes that the micro-organisms remain in the first eye and only the products of their metabolism reach the second eye and create papillitis. S. does not acknowledge sympathetic simple atrophy of the optic nerve, cataract (save as consequence of sympathetic uveitis), detachment of the retina, conjunctivitis, keratitis, iritis, and gives detailed arguments of his views. Sympathetic ophthalmia is generally not complicated by pathologic conditions of the other organs, and if so, they are accidental.

The pathologic anatomy of sympathetic ophthalmia shows almost complete identity of the anatomic changes of both eyes. The three parts of the uvea contain disseminated groups of mostly uninuclear cells, combined with diffuse infiltration of these cells of the whole tissues in more intense inflammations. With subsiding inflammation the characteristic structure of the uvea is replaced by pigmented connective tissue with very few blood vessels. Iris and ciliary body are covered with profuse fibrinous exudations with great tendency to organ-

ization, but not the choroid. S. considers these changes as characteristic of microbic inflammation; the microbes must be located in the groups of round cells, where they form a center of attraction for the leucocytes. The inflammatory changes of optic nerve, disk and retina are slight compared with the intensity of the uveitis, and are limited to small-celled perivascular infiltrations. This may be due to the anatomic structure differing from the very vascular choroid or to the etiology which in papillo-retinitis probably is toxic and not caused by the invasion of bacteria. Reproductions of numerous microscopic sections illustrate these conditions.

The qualities, which, according to Koch, a micro-organism must possess to be stamped as the pathogenic agent of a disease, are so far not found for a microbe of sympathetic ophthalmia. The bacteriological investigations resulted in positive and a still larger number of negative results. Lately S. succeeded with two positive results by implanting a piece of the ciliary body from an exciting and sympathizing eye of a boy into the anterior chamber of a rabbit. A chronic progressive inflammation developed successively in the iris, ciliary body and choroid, but not in the second eye. Enucleation in the stage of commencing phthisis was done after five weeks. The whole uvea was infiltrated by round cells without formation of giant cells. S. considers this unfortunately isolated result as a positive proof of bacteria in the sympathizing eye, despite negative microscopic and cultural comprobation, and suggests further experiments of implantation of parts of diseased eyes. Although the microbe of sympathetic ophthalmia is not yet found, S. thinks it illogical to conclude that sympathetic ophthalmia is not a microbic disease. Probably our methods are not sufficient to ascertain its existence. The clinical picture indicates that it cannot be one of the pyogenic bacteria; the chronic course, wanting histolysis, occurrence of giant cells and epitheloid cells rather point to a species of microbes which perhaps are related to the tubercle bacillus, syphilis bacterium or the hypothetic germs of tumors.

Compared with former decennia the prognosis has become better, probably owing to our better therapeutic measures, especially by limiting the operations on the sympathizing eye. It is decidedly better, when the inflammation sets in after enucleation of the first eye. To heal sympathetic ophthalmia is much more difficult than to prevent it; there a timely and correct prophylaxis is of paramount importance. Enucleation with removal of a considerable piece of the optic nerve is the standard operation. Where there is less probability of imminent sympathetic ophthalmia it may be replaced by optico-

ciliary resection, but this can only be decided in the individual case. The latter is, however, indicated if the patient refuses enucleation. Exenteration must be reserved for panophthalmitic eyes, whereas simple neurotomy is to be discarded. The local treatment of the exciting and sympathizing eyes and the general treatment are exhaustively described on twenty-one pages. Even after the onset of sympathetic ophthalmia the exciting eye may exert a detrimental influence upon its fellow, by transmission of repeated irritations through the ciliary nerves and new invasions of bacteria from its interior. Enucleation has been observed to act favorably, certainly not injuriously, upon the further course of sympathetic ophthalmia. But it is contraindicated as long as the eye is either not totally blind nor, without perception of light, hypotonic and shrunken, nor if extensive corneal opacities exclude all hope of recovery of sight. As long as the fate of the first eye is dubious expectation is better than too hasty enucleation, since the latter does not at once change the course of sympathetic ophthalmia. The chief and best remedy is mercury, then diaphoresis, bloodletting and general hygiene. Locally the mydriatics and moist heat are most valuable. S. found the application of 4 per cent atropine with 10 per cent cocaine in form of salves still effectual when solutions did not help. Subconjunctival injections of salt solutions act antiphlogistically by eliminating more rapidly the toxic substances, favoring the resorption of exudations in the anterior chamber and vitreous, and in some cases by lowering the increased tension. S. discusses critically the operations on the sympathizing eye, which may be performed to combat the inflammation, to diminish the increased tension and from optical reasons. Iridectomy as an antiphlogistic measure has to be abandoned. It must be regarded as a rule, to postpone operations as long as possible, to avoid a recurrence of inflammation. After a chapter on the history of sympathetic ophthalmia, S. passes in critical review the various theories as to the pathogenesis—the mere nervous, mere bacteriological, combined and toxic—and concludes with the remark that they still are strenuously opposed. So far it is only generally accepted—save by a few authors—that the sympathetic uveitis is a bacteriologic, and the pure papillo-retinitis a toxic disease. The very complete bibliography comprises 493 numbers.

C. Zimmermann.

On Trachoma, Especially Its Occurrence in Krain, Austria.

Bock, Dr. Emil, Ophthalmic Surgeon in charge of the County Hospital at Laibach. With a map. Wien, 1900, Josef Safar. Price, 1.50 M. 35 cents.

This interesting monograph gives a valuable contribution

to the much discussed subject trachoma. If an observer, like the author, practices in a relatively small territory, the various cases may be controlled for a long time and also the fate of such cases may be traced which never received medical attendance. They show that trachoma, much more frequently than hitherto supposed, may come to a standstill even without treatment. From anatomic investigations and clinical observations B. discriminates trachoma from follicular conjunctivitis. The granules of trachoma are lodged in the deeper strata of the conjunctiva, from which only a part of their globular surface projects, and penetrate into the tarsus. Generally it appears at first in the fornix and tarsus of the upper lid, extends into all strata of the conjunctiva, leaves scars and, in a number of cases, affects the surface of the cornea. Trachoma is very contagious by immediate transmission, is the prototype of a chronic disease, occurs sporadically and epidemically, is endemic in many parts of the earth and is a disease of families, orphan asylums, etc. The younger a person the more severe is its course. Old people become more seriously affected than persons in the prime of life. Poverty and uncleanness predispose to it.

The granules of follicular conjunctivitis are at the conjunctival surface of the upper and lower lids, especially in the lower fornix, have the size of poppy seeds or larger, are light pink or appear transparent like vesicles, and consist of lymphatic tissue. The palpebral conjunctiva alone is diseased with them, the other parts of the lid and globe remain intact. It lasts long, but always subsides without scars, it is contagious and is a school disease. Trachoma is malignant, follicular conjunctivitis benign.

The granule of trachoma is an inflammation of the connective tissue caused by irritation from a still unknown microbe like in tuberculosis, lupus, lepra, etc. The granule of follicular conjunctivitis is regular adenoid (lymphatic) tissue, which partly is visible in the healthy conjunctiva of the lower lid, especially the fornix (particularly in lymphatic people), partly becomes visible from swelling by inflammatory irritation. Sometimes it is difficult even for the experienced to distinguish between both conditions, so that a longer observation is required. The chief remedies are nitrate of silver and sulphate of copper; sublimate not in recent, but in old cases with scars and relapsing superficial keratitis; protargol (2 per cent) in cases approaching recovery, but not jequirity. B. excises the upper fornix with following sutures, if it contains single granules, or in exuberant tissue, so that the medicinal treatment is insufficient. He prefers the destruction of the granules with the galvano-cautery to expression with finger-nails or roller forceps.

As to the occurrence of trachoma in Krain B. saw in 12 years 741 cases among 22,539 eye patients, i. e., 3.98 per cent. It occurs sporadically in many places, in some endemically, and is dependent not upon the soil, but the more lively intercourse with other people, lacking cleanliness, which in the southern part is due to the scarcity of water. All forms were observed and more in women. It is imported, as by soldiers, from adjacent countries, where trachoma is prevalent. (Steiermark, Croatia and the Adriatic shore.)

B. makes the following suggestions for the elimination of trachoma and prevention of its spreading: Every case of trachoma has to be reported to the health officer, who has to see that the directions of the surgeon as to treatment and prevention of propagation are carried out. Children must stay out of school, as long as their eyes are discharging, laborers from common workshops, salesmen from business, etc. The patient has to keep a card, on which the surgeon marks the dates of treatment, to be controlled by the health office. Persons violating these rules are to be severely punished. Schools, orphan asylums, etc., in which a number of pupils are diseased, must be closed. The affected must occupy separate bedrooms and are not allowed to leave the institution before they are cured. Epidemics require especially strict measures. Schools must be examined from time to time and also the population of regions in which trachoma has broken out. Teachers may treat patients who live too far away from a surgeon, but the latter must superintend the treatment at regular intervals. The military administration is to be notified of occurrence of trachoma, if drilling exercises are held in such regions, to protect the soldiers from infection. A general law ought to be adopted to enforce these rules under penalty if counteracted.

C. Zimmermann.

On the Structure and Development of the Lens.

Rabl, Carl, Professor and Director of the Anatomic Institute of the German University of Prag. 324 pages, with fourteen lithographic plates and 132 figures in the text. Leipzig, 1900, Wilhelm Engelmann. 15 Mark, \$3.75.

In this fundamental work the author intends to show the important part the lens takes in the evolution of the eye by the most exact and elaborate researches in comparative embryology and anatomy of the lens in different classes of animals. We have not only to admire the indefatigable industry, with which R. carried out his intricate investigations, under considerable external difficulties, but also the vast array of new facts he brought out in this apparently exhausted field, and his views bearing on general biology and pathology. In the preface he sets forth his method of examination. A mix-

ture of sublimate with chloride of platinum and picric acid is used as fixation fluid. In cutting the lens, imbedded in paraffin, the surface must be touched with a camel's hair brush dipped in hot paraffin, after each section, lest the lens breaks. Large lenses must be bored out with a lancet and the hole is filled with paraffin. The sections are fastened with oil of cloves and collodium, and stained on the slides, or the lens is stained in toto.

The special part commences with the development of the lens of Selachii, of which R. examined *Pristiurus melanostomus* and *Torpedo marmorata* and *ocellata*. Whereas in all other vertebrates the cavity of the invagination of the stratified plate at the surface of the ocular vessel passes directly into the cavity of the lens vesicle, in Selachii the latter forms independently of the former cavity which disappears. R. therefore concludes, that the lens pit of the Selachii corresponds only to the entrance, not to the whole lens pit, of the other vertebrates, which he considers as the more simple and original type of lens formation, the former as a modified type. Meridional sections through the lens easily arouse the deception as if the lens fibres were arranged in concentric lamellae like an onion. But the concentric lines are not the borders of whole lamellae of fibres, but merely contours of single lens fibres. The same illusion gives the breaking of hardened or dried lenses in concentric strata, which is due to the equal consistency and equal chemical and physical constitution of lens fibres of the same age. Equatorial sections disclose the fallacy of this assumption, which, if the latter were correct, would also show concentric lamellae, but, instead of the latter, they present the lens fibres united to radial lamellae, resembling the structure of an orange, not of an onion. The regularity of this radial arrangement is astonishing, and is easily explained by the grouping of the cells of the lens epithelium at the epithelial border. Here the lens fibres are formed. Each new fibre is superimposed upon the preceding fibre and the totality of all fibres constitutes one radial lamella. Their number corresponds therefore to the number of the meridional rows at the epithelial border. The formation of the radial lamellae occurs towards the end of embryonic life. An equatorial section of the lens of Selachii shows three parts; the chief mass consists of radial fibres: the chief fibres, the central fibres and between both the transitory fibres. Through the hardening process the radial lamellae separate and from radial clefts. In equatorial sections the transverse sections of the lens fibres which are long flat hexagonal prisms appear in form of hexagons or quadrangles. The zigzag lines of their sides represent the borders of the lamellae.

The lens of amphibia shows also the radial formation of lamellae. It seems that the lens deviates the more from the spherical form the more animals replace aquatic by aerial life. They as well as the Selachii show a short anterior vertical and a posterior horizontal suture. The thickness of the lamellae and the width of the fibres grow from within outwards.

The lens of reptiles is described from the observations of R. on the lens of *Lacerta agilis*. Of especial importance is the formation of the annular ridge (Ringwulst) from the epithelium of the lens and the fact that the cells of this ridge present a polar differentiation from the earliest stages. The snake (*Ringelnatter*, *Tropidonotus natrix*, ringed snake) shows not the least trace of an annular ridge, and the lens is almost spherical, that of the lizard very much flattened in front. The shape of the lens of different reptiles is of extraordinary variety which finds an analogy only in birds. The Chamaeleon has the greatest annular ridge of all Saurii.

In the section on the lens of birds the annular ridge of the pigeon is fully described. The impression on its surface, the wave-like flexures of the nuclear strata, the formation of the clubs and spindles of its fibres in whorls are ascribed to the pressure of the ciliary processes, which finally changes the shape of the lens in toto, and R. concludes that the annular ridge plays an important part in the accommodation of the eye. In the most rapid flyers, e. g., swallows and swifts, the annular ridge is greatest, in fact its volume grows with the rapidity of flying. The proportion to the latter in the pigeon, swallow and swift is 27: 67: 88, and the size of the annular ridge 16: 35: 40. The swiftest flyers require the swiftest accommodation. In the case of the Chamaeleon, whose annular ridge corresponds in size to that of the swallow, a rapid accommodation is needed to enable the very slow animal to catch the fast moving insects. The annular ridge is very small in night birds, whose large pupil and large lens, which are more useful to receive the greatest amount of light, are an example of functional adaptation. The number of radial lamellae in birds is larger than in reptiles, and in the larger animals of the same order greater than in the smaller ones.

The development of the lens in animals differs materially from that of the other vertebrates. R. studied it chiefly in the rabbit, in which he found the first mark of a lens in an embryo about ten days old. The human lens is relatively the smallest and the flattest; an equatorial section cuts its axis before its center. The equator has indentations apparently corresponding to the insertions of the fibres of the zonula. The fetal lens shows triangular lens stars, that of the adult six and nine rays, resembling lightning figures. The number of radial

lamellae in animals in general is much greater than in all other vertebrates. Among the animals the smallest forms have the smallest, the largest forms the largest number, but the absolute size of the lens does not determine the number of radial lamellae; e. g., the lens of the rabbit has about the same diameter as that of the cat, but the number of radial lamellae of the cat is by a third greater than in the rabbit. Within the same order or family the larger forms, which generally have larger lenses, have more lamellae than the smaller ones. Young animals have, without exception, less than old ones, e. g., in a child three months old R. found 1,474, in an adult 2,111, in another 2,258 lamellae. They multiply by division and by intercalation of new lamellae. The lens of monkeys and man exceed in irregularity of the course of the radial lamellae and in variety of the cross sections of the fibres those of all other animals. R. recognizes in this an extraordinary plasticity of the fibres and consequently an extraordinary elasticity and adaptability of the whole lense, which insures a more perfect accommodation. Although nothing definite is known of the rapidity of accommodation in the various species, the range of accommodation in man and monkeys is greater than in other mammals. R. here emphasizes the exact correspondence of the anatomic investigations of the lens with the results of the functional examinations of Hess and Heine, who found by their recent experiments that our common experimental animals, dogs, cats and rabbits (even in youth) possess only rudimentary accommodation in comparison to man, whereas they found in *Macacus rhesus* a range of accommodation of 10 to 12 D., which almost amounts to that of man. The width of the fibres in animals is much less than in birds and reptiles. The capsule in dogs of the smallest race is much thicker than those of larger races.

The structure of the lens of bats and the mole is discussed in an appendix. The former corresponds to a condition of the lens of the other mammals in a certain embryonic stage and the whole eye seems to be rudimentary, it certainly shows an inferior functional state. The lens of the mole has no meridional rows at the epithelial border nor radial lamellae. It has only central fibres, which also soon degenerate.

In a retrospect R. emphasizes the importance of embryology in the study of organic beings. Comparative embryology is nothing but comparative anatomy of embryos at corresponding ages and has a much greater value in investigating the relations between organisms than comparative anatomy. The observation of successive morphological stages is the necessary base for the understanding of the casual connections of the phenomena, i. e., for developmental mechanics,

organism and each organ has a specific development of its own, owing probably to the anatomic structure of the egg. Comparative embryology marks out from the successive morphological stages those, in which the embryologic units present the same structure, and these are called corresponding stages. The development of the lens in vertebrates shows the following correspondence: It develops from the ectoderm from a solid proliferation or an invagination, and forms a primary vesicle, from the lateral wall of which the lens epithelium grows, the fibres from the medial wall. The anterior border lies at first, at the equator, where the cells are arranged in meridional rows, from which the radial lamellae develop. In spite of this principal correspondence each class of vertebrates has typical peculiarities.

One of the chief results is that the lens consists of radial lamellae and not of concentric strata. The anatomic structure of the lens in different animals shows that each organism has also a specific anatomic structure which preserves all its characters from the commencement of its individual existence to its termination.

Physiological moments determine the different structure of the complete lens which reflects the habits of life of an animal. The author corroborates these views by an interesting chapter on the relation of the lens to accommodation, the action of motion, etc. Finally he shows how his new theory of the radial lamellae explains best the sector shaped cataracts, the incipient cataract, the riders in zonular cataract and certain peculiarities of anterior and posterior cortical cataract, and concludes with an essay on new problems of comparative histology with regard to situation, number and size of the epithelial cells. Fourteen excellent lithographic plates and figures in text clearly illustrate the single phases of development and the structure of the lens in the diverse classes of vertebrates. The publisher, Mr. Wm. Engelmann, also deserves special credit for the splendid external appearance of this admirable work, which is a most valuable contribution not only to anatomy, embryology and biology, but also particularly to ophthalmology. We highly recommend its study.

C. Zimmermann.

The Removal of the Transparent Lens by Operation.

By Dr. Ernst, Professor and Director of the University of Bern, 206 pages, Wiesbaden, 1900, J. F. Bergmann, 7.60 Mark, \$1.90.

This book is an extended report on the subject presented before the French ophthalmological society in 1899. After a short historical introduction, P. Ernst states the two chief objections raised against the operation: The loss of accommodation and the inclination to

detachment of the retina. He advocates clinical ophthalmometry of each case, not only for the determination of astigmatism, by the knowledge of which too great operative astigmatism may be avoided or pre-existing astigmatism may be corrected by the operation, but also of the radii of corneal curvature. From the latter the distance between retina and posterior chief focus may be directly calculated. According to Girard-Teulon the dioptric constants of eye and correcting lens are most favorable, if the latter is placed in the anterior focus of the eye. The mathematical expression of the degree of ametropia is duly set forth, as well as the diminution of refraction by aphakia, and illustrated by tables. 100 pages are occupied by the clinical histories of 103 cases, of which 108 eyes were operated upon, which have been observed for years before and after the operation. For a better resume of the results the most important points of the clinical histories are arranged in tables. The youngest patient was $7\frac{1}{4}$, the oldest 51 years old. No definite age can be set as limit for the operation, nor a certain degree of myopia. The latter must be considered with relation to the age of the patient, the refraction of the cornea, vision, condition, social position, observation of the individual case of myopia as to its progress, and of myopia in the family of the patient. V. and visual field have been improved by the operation in all cases, except four, very likely by better nutrition of the choroid and retina. In 51 cases hypermetropia, in 13 myopia resulted, but in no case was the myopia progressive after the operation. The observations of eyes left alone and those operated upon showed the relatively very great prophylactic effect of the operation in very high myopia. 73 per cent of the eyes before operation were complicated with corneal astigmatism of higher degree than 1.25 D. But not only the percentage of astigmatism is greater in highly myopic eyes than in eyes in general, but also the degree of astigmatism is higher in myopes. Corneal astigmatism remained unaltered after the operation in 26 eyes, increased in 35, decreased in 33. High myopia occurs with any curvature of the cornea. The majority of cases show a corneal refraction analogous to that of the majority of human eyes in general. A relatively great percentage of high myopia is found in eyes with higher corneal refraction, 45 and more dioptries, which is relatively rare in eyes of other refractions. The refraction of the cornea seems to be in a certain relation to the index of the orbit, viz.: hypsiconchia, with high, chamaeconchia with low corneal refraction. Both chief corneal meridians became flatter by the operation.

Sixty eyes presented choroidal changes. P. considers them not as contraindication to operation. Even the severe acute

central choroiditis is for him an urgent indication for the operation. He rather sees a curative action in the operation, as he obtained the most excellent and surprising results in five such severe cases. P.'s method of operating was discussion with subsequent linear extraction. In 62 cases secondary cataract followed, but only 54 submitted to a secondary discussion. He never observed postoperative glaucoma, and thinks that its chief cause is discussion of the capsule soon after extraction. The operation of the secondary cataract is even more important in these cases than in ordinary cataract, as the former have a greater tendency to detachment of the retina. The author considers those methods as the least dangerous, in which the instruments penetrate least into the vitreous. A prolapse of vitreous into the canal, entailing the danger of infection and detachment of the retina, may be avoided by introducing the instruments peripherally and subconjunctivly through the limbus into the anterior chamber. P. emphasizes the proposition to prevent the condition of the formation of secondary cataract. He never met with detachment of the retina, except in one case after four years, which cannot very well be charged to the operation. More than once he saw prolapse of vitreous in consequence of the efforts to evacuate the lens matter completely. Repeated extractions are better than to evacuate all at once by too much pressure.

In the last chapter the other indications for removal of the lens are discussed, as lenticonus, keratoconus, ectopia of lens, dislocation of lens, certain malignant forms of glaucoma, total posterior synechiae. An extensive bibliography concludes the monograph, which, on every page, amply shows the conscientious labor the well known author has devoted to it, so that it will serve as a most reliable theoretical and practical guide in this modern field of operative ophthalmology.

C. Zimmermann.

Neurology of the Eye.

Wilbrand, Dr. H., oculist, and Saenger, Dr. A., neurologist, Hamburg: Die Neurologie des Auges, ein Handbuch f. Nerven und Augen-Aerzte. Volume I, Part 2, 8mo, 390 pages, with 88 figures in the text. Wiesbaden, J. F. Bergmann, 1900. 8 M., \$2.

The second part of volume I of this elaborate handbook commences with a continuation of the chapter on ptosis, which occupied 235 pages of the first part, from page 306 to 451. This extensive space devoted to one symptom alone gives an impression of the exhaustiveness of the whole work, which is calculated to fill four volumes. A bibliography of 1513 numbers, drawn upon in the first volume, precedes the text.

From the combined labor of the two authors, both well known in their special fields, with large experience gained from an immense hospital material, a work has been produced which has not its equal in completeness and thoroughness. It is a handbook of encyclopedic character, which will give the richest returns, when consulted on any question bearing on the two branches of science, and thus will be a standard work of the highest order.

Ptosis in consequence of syphilis is described in detail from syphilitic tarsitis, gummous periostitis of the orbit, superior orbital fissure and gummous inflammation of the cavernous sinus, then the syphilitic affections of the oculomotor nerve at the base, roots, nuclei and cortex, followed by a chapter on the topic diagnosis of the site of the functional disturbances of the oculomotor nerve in syphilis. The next sections deal with ptosis, from cerebral hemorrhage, softening and abscess, basal tumors and meningitis, and from trauma, affecting the levator muscle or its orbital nerves directly by various kinds of impact, or indirectly by lesions of its surroundings, or of the stem, the nuclear and cortical portions of the oculomotor nerve. A great variety of different localizations of cerebral tumors is enumerated, all of which may produce ptosis. Further causes are multiple neuritis, Landry's paralysis, polymyositis and functional nervous disturbances, as hysteria. Here a very interesting chapter is devoted to ptosis in recurrent paralysis of the oculomotor nerve, with own observations of the authors, concluding with ptosis in sleep, in diseases of the orbit, and accessory cavities, the mixed forms of ptosis and pseudo-ptosis, and sympathetic ptosis.

In chapter 8, on the relations of the facial nerve to the eyelids, the authors enter into the anatomy of the facial nerve, its cerebral origin and connections, and that of orbicularis, corrugator supercilii and frontalis muscles, with due consideration of their physiological functions in the closure of the lids, reflex and synergic movements. After discussing the congenital and hereditary defects of the muscles, supplied by the facial nerve, the spasms of the muscles are described, the tonic, clonic and mixed spasm of the orbicularis, the condition of the stapedius muscle in blepharospasm, and amaurosis after blepharospasm, caused by lack of nutrition of the retina from the permanent pressure. The organic lesions eliciting spasms of the orbicularis may be: Tumors, abscesses, foci of softening, cysts, which directly irritate the different sections of the facial nerve or its central path. The reflex spasms are produced by affections of the fifth nerve, the merely functional spasms by functional irritations of the cortical area of the facial nerve in chorea, migraine, epilepsy, hysteria, or as reflexes

from the fifth, optic or sympathetic nerves. The paralytic conditions of the muscles, supplied by the ocular branch of the facial nerve, are described in organic lesions of the cortical, subcortical, nuclear and peripheral portions of the nerve, unilateral and bilateral, functional paralysis in hysteria, epilepsy, hemicrania, and paralysis of the orbicularis muscle from progressive muscular dystrophy. A detailed table of contents and an alphabetical index facilitate quick orientation in the voluminous book. A large number of very good pictures of anatomical conditions and clinical portraits illustrate the subjects described. C. Zimmermann.

The Essentials of Ophthalmology.

Asher, Dr. W., Leipzig, Repetitorium der Augenheilkunde, im Anschluss an die neueren Lehrbücher. With numerous illustrations. Leipzig, A. Deichertsche Verlagsbuchhandlung Nachfolger (Georg Bohme), 1900, 12mo., 209 pages, M. 3.25, 80 cents.

In this little book the author aimed to give a concise review of the chief facts of ophthalmology as it may be welcome to the student, who, after visiting the clinic and thorough study of a text book, wishes to rapidly peruse the chief points. The disposition and arrangement of the subject matter follow the excellent textbook of Fuchs, and thus form a short abstract of the latter, with scientific figures, presenting the most important conditions. A special index of relations of ocular affections to other diseases is appended for the benefit of the general practitioner. Although we miss some things the mentioning of which would not have detracted from the conciseness of the book—e. g., the use of a convex glass behind the mirror in indirect ophthalmoscopic examination instead of accommodating, the possible outbreak of an acute attack in simple glaucoma, after the use of euphthalmine, the beneficial effect of posterior sclerotomy in some cases of glaucoma preliminary to iridectomy, skiascopy, ophthalmometry, which the author, probably of different opinion, may have purposely omitted—the general plan is very well carried through by giving the chief facts in a handy form readily looked over and easily remembered.

C. Zimmermann.

Kroll's Stereoscopic Pictures for the Use of Squint-Eyed People.

Perlia, Dr. R., Krefeld, Kroll's stereoskopische Bilder zum Gebrauche f. Schielende, 28 colored illustrations, 5th improved and enlarged edition, Leopold Voss, Hamburg, 1,000 M., 75 cents.

Kroll's stereoscopic pictures for enforcing binocular

vision in squinting children, or for orthopedic exercises after squint operations, are too well known to require further recommendation. The new, fifth, edition, contains a still larger number of plates with congruent chief figures and incongruent accessory figures. Instead of one picture with adjustable halves, two are given. The accompanying text in German, English and French, gives directions, and the order in which the various plates are to be used. The pictures represent subjects which amuse and fascinate the children, and thus facilitate those otherwise tedious exercises.

C. Zimmermann.

Atlas of Topographic Anatomy.

Zuckerkindl, E., Prof., Vienna, Part II.: Thorax, in 48 colored pictures, with explanations, 66 pages. Wien and Leipzig, W. Braumuller, 1900. 4 M., \$1.

The second part of this beautiful atlas deserves the same praise we were glad to express in our review of the first part (in the July number of the *Annals*, 1900, p. 559). It presents, in excellent execution, different aspects of the intraclavicular fossa and the armpit, not in typical schematic form, but in true representation of the conditions found in the subjects, of the topographic relations of lungs and heart to the anterior wall of the chest, of the diaphragm, lungs, pericardium, heart, sinus and ostia of the heart, anterior and posterior mediastinum, topography of the cardiac nerves, sagittal sections through right and left half of the thorax, and horizontal sections through the latter at the level of the third, fifth, seventh and eighth dorsal vertebrae. The third part, containing the topography of the abdominal cavity, is in press and is promised to be published soon.

C. Zimmermann.

Skiascopy.

Neustutter, Dr. Otto, Munchen, Grundriss der Theorie und Praxis der Schattenprobe (Skiaskopie). With illustrations, 59 pages. Also explanation to "Tafeln und Phantome zur Skiaskopie." Munchen, J. F. Lehmann, 1900. 1.20 Mark, 30 cents.

This little book was originally designed for the description of the "tables and phantoms of skiascopy" of the author, published by J. F. Lehmann (price 30 mark, \$7.50). But to give to the reader something complete, the author extended it to a concise treatise on skiascopy. After a historical introduction and definition of skiascopy the optical laws are set forth, on which the shadow test is based. First the entering rays, i. e., the way of rays from the source of light and the mirror to the retina of the patient are considered by experiment with mirror, a convex lens and a screen, and

construction of the circles of diffusion with regard to their variation if a plane or a concave mirror is used, in the same manner the outgoing rays, in myopia and hypermetropia, and if the neutral point is reached. A short schematic demonstration of the total course of rays is followed by the description of the phenomena of astigmatism, and a chapter of the practical execution of skiascopy. The essential points of skiascopy are very exactly and fundamentally explained, so that the book can be highly recommended for the thorough study of this important and valuable mode of objective test of refraction.

C. Zimmermann.

Chart for Testing Vision by Means of the Watch Dial.

Praun, Dr. E., Darmstadt, *Tafel zur Bestimmung der Sehschärfe mittelst der Uhr*. Wiesbaden, J. F. Bergmann, 1901. 1.20 Mark, 30 cents.

As the ordinary types may be easily learned by heart in visual tests for any length of time, especially if a great mass of people are examined, a greater variability of the charts is very desirable. For that purpose P. devised this new chart with different positions of the hands on circles of different sizes, representing clock faces. By turning the squares containing the circles—the chart gives 180 different positions of the hands, the ordinary vision card only 40 to 50 signs in stereotypic succession—such a great variety in the positions of the hands is obtained, that their succession cannot be committed to even the best memory. Thus a voluntary or involuntary deception is excluded, because each position of the hands must be separately perceived by the eye. The idea as to the variability of the test objects is very good, but, since the dials, as P. calls them, are no dials, but circles which present only the hands, and not the figures for the hours, many people will not be able to describe the position of the hands exactly, not knowing the places of the former by heart. Even if the single figures on a distant clock are not recognized as such, they at least as dark points form marks for better orientation. To allow also of greater variability by turning the dials, we would suggest to divide the circles into four parts, with marks to represent the hours of 3, 6, 9 and 12. The graduation of the difference of length between both hands on the chart diminishes absolutely less than the width of the hands, thus rendering the distinction between both hands on the smaller dials very difficult, especially since the periphery of the circles is not clearly visible, being too fine. Comparing P.'s chart with Snellen's test types, we found that they form a larger scale than the former.

C. Zimmermann.

Pictures for Stereoscopic Exercises.

Dahlfeld, Dr. C., Riga, Bilder f. stereoscopische Uebungen zur Gebrauch f. Schielende. Twenty-eight plates, with explanatory text, 3d edition. Stuttgart, Ferdinand Enke, 1900. 4 Mark, \$1.

Stereoscopic exercises can be only of benefit, if both half pictures of the plates are perceived simultaneously in the stereoscope. For this purpose the second of Dahlfeld's plates, which appear now in the 3d edition, is designed. Each half presents a congruent large cross, and a smaller incongruent one. If the patient sees three crosses, the above condition is fulfilled.

The next means to overcome exclusion is the rapid alternate covering of one eye. Thus the patient is compelled to fixate alternately with either eye, which frequently may lead to binocular perception of both pictures in the moment in which both eyes are left free. The first plate containing a congruent horizontal black bar in both halves and a red in one, a green bar in the other, assists materially in this experiment on account of the strongly contrasting colors. If successful, the other plates with black figures may be employed. Plate 28 consists of movable pictures with gauge for graduation of the exercises, according to the progress in binocular fixation. For the perception of different depths of the figures, plates 22 to 27 are to be used, and, if solved satisfactorily, the patient will be able to see stereoscopically more complicated stereoscopic drawings, landscapes, etc. The plates are very neat and interesting, and have our hearty recommendation.

C. Zimmermann.





Fig. IV.





Fig. III.



Fig. I.



Fig. II.

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EXOPHTHALMOS, THE RESULT OF AN OSTEO- POROSIS.*

BY P. N. K. SCHWENK, M. D.,

ATTENDING SURGEON TO WILLS' EYE HOSPITAL, PHILADELPHIA, PA.,
U. S. A.

On the twenty-seventh of November, 1900, J. T., a thirty-three year old man, born in Philadelphia, reported to my clinic at Wills' Hospital on account of failure of vision and inflammation of the eyes dating back for about six months' time. He stated that he had one brother and one sister living, both younger and healthy, and that his parents who were dead, were not related before marriage. On the twenty-first of December, 1880, while plying his occupation as a news-boy he sustained a fracture of the right hip by a fall on the ice; this yielded to treatment without any complications.

In August, 1883 he was struck on the right lower jaw by a baseball bat, producing a fracture which was treated at the Jefferson College Hospital.

On the twenty-fifth of October, two years later, while sitting on the back part of a newspaper wagon, he caught his left leg in the spokes of the rear wheel resulting in a fracture of left fibula, which was treated at the Pennsylvania Hospital.

Soon after accident to the jaw, during the same year, he noticed a swelling of the lower jaw in region of the recent accident; this swelling increased in size until 1889, when it became quiescent.

When I first saw the patient, examination of the case show-

*Read before the Ophthalmological Section of College of Physicians in Philadelphia, Jan. 15th, 1901.

ed that the vision with the two eyes separately was reduced to one-fortieth of normal.

As can be seen in the sketch reproduced from a photograph made by the Junior Resident Surgeon at the hospital, Dr. Frank Parker, there was a marked proptosis. Both eyes were deviated to the temporal side, while the right one was pushed far down and below the margin of the orbit; the eyeballs being held in position mainly by the stretched and elongated orbital tissues. This is very well shown in picture No. 3, from a photograph made by Dr. Parker.

The eyeballs retained some power of upward and lateral rotation. The eyelids were unable to cover the cornea. The cornea itself showed some breaks and erosions in both its superficial and deep structures. The left pupil was diamond shaped, and about one and a half millimeters in size. The iris was immovable. The eye-grounds could be seen, showing a partially atrophic disc, with a reduction of the retinal vascularity. There were no other gross fundus changes. The refraction was myopic to a medium degree, the eye-ground being best seen with a concave spherical lens of three diopters' strength. The right cornea showed several nebulae, the pupil was dilated evenly, while an imperfect view of the fundus evidenced a partially degenerated nerve-head.

Vision with either eye could not be improved with any correcting glasses. Intraocular tension was normal.

One month later, the patient was admitted to the wards of the hospital when a small median tarsorrhaphy was done on the right eyelids by my assistant surgeon, Dr. Burton K. Chance, union taking place in a few days' time.

Figure 3 gives an excellent idea of the gross appearance of the patient's face. It will be noticed that the right side of the face is much lower than the left, the soft parts being considerably stretched, and both broadened and lengthened. The wing of the left nose appears as if it had been split by a long, narrow fissure, extending its entire length, while the nasal bridge is both markedly and irregularly flattened. The horizontal planes of the face, as shown by the angular deviations of the brows, the eyes and the mouth are greatly distorted and dragged downwardly to the right side.

Careful study of the chin will make it at once evident that the enlarged portions of the lower part of the face do not include to any extent the lower mental notch or fissure. Both the eyeballs and the orbits are markedly separated, and the upper lip and the chin are considerably broadened.

The eyelids are enlarged, especially that of the right eye, this being well shown in figure 4. The skin seems devoid

of hair, although the eyebrows and eye-lashes are well pronounced.

Figures 1 and 2, reproduced from a photograph taken when the patient was twenty-two years of age, show the great contrast between his condition at that time and at present.

REMARKS.—The fact that cases of this kind are so extremely rare in ophthalmic literature has been the inducement for me to offer this instance for publication and record.

Commencing some fifteen years ago in the region of the recently inflicted traumatism, the parts painlessly continued to grow quite rapidly for a period of seven years; and although the patient deemed the condition to have become quiescent at the end of that time, yet there was a slow increase in the size of the involved tissues as shown by the photographs and the assertions of the patient's friends.

The involvement of the soft parts of the visual organs in which we are directly concerned, is of great interest from two stand-points: 1. The gradual expulsion of the eyeballs and the surrounding tissues from the orbital cavities, so that in the words of the patient, he could at will actually dislocate the right eyeball from its socket, and 2, the partial dessication of the anterior face of the organs necessitating a tarsorrhaphy in the right eyelids.

In addition, the atrophic changes taking place in the optic nerves themselves by which vision was gradually lessened, and the ophthalmic picture of an almost complete optic nerve atrophy was obtained, are of particular value in illustrating the effects of both stretching and pressure processes upon the tissues of the optic nerve.

The general condition itself, one of rarefaction of the osseous tissues, set into action by inflammatory changes, is not a new problem in osteology, and is well understood both clinically and pathologically; i. e., as Agnew says: "An osseous change, the result of inflammation in which the inorganic elements of the bone are measurably destroyed, the vascular canals becoming larger and larger by the absorption of the partition walls until the entire bone, enlarged in its bulk, but diminished in its weight, resembles in structure a sponge.

*In the preparation of this article, I am very grateful to my friend and colleague, Dr. Charles A. Oliver, as well as to Drs. George C. Harlan, William F. Norris, S. D. Risley and William L. Zuill.

MYOSIS AND PTOSIS FROM PARALYSIS OF THE CERVICAL SYMPATHETIC BY GUN- SHOT WOUND.*

BY GEORGE C. HARLAN, M. D.,

ATTENDING SURGEON TO THE WILLS' HOSPITAL, PHILADELPHIA, PA.,
U. S. A.

S. R. twenty-two years of age applied at the Wills' Hospital for treatment of trachoma and moderate myopic astigmatism. A marked difference in the size of the pupils was incidentally noticed and close examination showed a slight but decided drooping of the right upper lid. The patient then called attention to a wound scar on the anterior margin of the right sternocleidomastoid muscle at about the level of the cricoid cartilage—the result of a wound by a rifle ball received five years before. He was in a stooping position, looking for a rabbit in a pile of rails and was wounded by the accidental discharge of a rifle in the hands of a boy in front of him, on the other side of the rails. The course of the ball, which was never traced and could not be located by X Ray examination, must have been downwards and backwards, probably grazing the front of the carotid.

The pupil of the right eye in ordinary daylight was two and a half millimeters in diameter while that of the left measured four and a half millimeters. With weak illumination the diameters were five millimeters and seven millimeters respectively. The reaction was as prompt in the right as in the left. Under homatropin the pupils retained the same relative size. It was two millimeters less in the right than in the left.

When the patient looked directly forward, the edge of the upper lid of the right eye covered the upper margin of the pupil. The voluntary movements of the lid were normal. The vision of the two eyes was the same and the accommodation of the right was not affected. There was some difference of opinion about the tension, but no positive decrease could be made out. The condition of the lids which was rather worse on the right side, increased the difficulty of an accurate de-

*Read before the December, 1900, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

termination of the intraocular tension. No other symptoms could be recognized and there was no history of unilateral sweating.

The ocular symptoms that have been attributed to paralysis of the cervical sympathetic, from experimental section, accidental injury or pressure of morbid growths, are myosis, ptosis, enophthalmus, decreased intraocular tension and retinal hyperemia. Accompanying vascular symptoms are congestion, increased temperature, and excessive sweating of the corresponding side of the head.

The myosis is due to paralysis of the radiating nonstriated muscular fibres of the iris, the existence of which is now pretty well established; and the ptosis to paralysis of Müller's nonstriated fibres in the levator. The sympathetic ptosis of Swanzy. This was first suggested in 1869 by Horner (*Klinische Monatsblätter für Augenheilkunde*) who also first called attention to the decreased intraocular pressure. These two symptoms, myosis and ptosis were described by Petit in the beginning of the nineteenth century and have been found most constantly.

The enophthalmus has been observed only occasionally and is probably due to relaxation of Müller's orbital fibres though the anatomy and physiology of this muscle do not seem to be definitely determined. Wecker speaks (*Traite Complet*) of it as a retractor and says "it is true that, in man, this retractor exists only in a rudimentary state but it is perhaps sufficiently developed to be able to cause the globe to recede a little in its cavity under the influence of an excitation of the sympathetic." I can find no direct reference to Müller's orbital fibres in Norris and Oliver's System, but Dr. Bull states that "in all cases of enophthalmus the intrapalpebral fissure is narrowed, and in many of them there is myosis," and refers to "the displacement backward of the eyeball which has been noticed in paralysis of the sympathetic nerve."

Decreased intraocular tension is also not a constant symptom and is not satisfactorily explained. Enophthalmus and diminished tension in many experiments, have not appeared until several weeks after the section of the nerve. It is of interest in this connection that the retraction of lids and dilation of pupil in exophthalmic goitre and sometimes in hysteria, and in the earlier stages of tabes, are not accompanied by increased tension.

The vision is not affected. Dufour in six cases found no diminution of visual acuity, and Nicati (*La paralysie du nerf sympathique cervical*) states that in all his observations

whenever there was a difference of vision in the two eyes, it could be satisfactorily explained by causes independent of the sympathetic.

The accommodation is never involved (Nicati, Parinaud, Wecker). In the case reported by Mitchell, Morehouse and Keen it is stated that "the eye had become myopic," but the myopia had probably existed previously.

The retinal hyperemia is perhaps found only in the earlier stages. Nicati states that, in what he calls the second period of paralysis, characterized by atrophy, the affected side of the face becomes paler than the other and the temperature and the sweating are less. He considers this due to atrophy of capillaries and subsequently of the tissues.

Though many cases of paralysis of the cervical sympathetic from pressure by morbid growths, particularly by enlargements of the thyroid and of the lymphatic glands, have been observed; the reported cases of direct traumatism of this nerve have been extremely few.

The first was recorded by Mitchell, Morehouse and Keen ("Gunshot Injuries of the Nerves"), who, in explanation of the extreme rarity of such cases, say that it "is due to the anatomical situation of the sympathetic, which makes it almost impossible to touch it with a missile without at the same time disturbing other parts whose lesions are usually fatal. So plain did this seem to us, that for a time we hesitated to admit the possibility of the sympathetic nerve being injured in the neck by a ball."

Nicati refers to two other cases: one of a punctured wound and the other of an accidental one occurring during a surgical operation.

NEW TEST-TYPES FOR DETERMINING THE ACUTENESS OF VISION.

BY DR. EDMUND LANDOLT.

PARIS, (FRANCE.)

One distinguishes, as is well known, three different functions of the retina: the *perception of light*, the *perception of color* and the *acuteness of vision*. The first of these functions produce a luminous impression; the second, by the smallest quantity of colored light required to make the organ recognize the given color.

As to the acuteness of vision, it is determined by the *small-visual angle at which the eye can distinguish two points as being separated*.

The acuteness of vision is, therefore, inversely proportional to the smallest visual angle. As it is a question of relatively small angles, the visual acuity is estimated as inversely proportional to the space which separates the two points; or, if the interval between the points be constant, as proportional to the distance which separates the eye from the test object. The standard visual acuity corresponds to an angle of *one minute*.

It would not, however, be possible to estimate the acuteness of vision by means only of two points of variable distance, because it is almost impossible to determine, with precision, the moment when two points cease to be seen as separate, and become merged in a single visual impression.

It is for this reason, that more or less complicated test objects, especially capital letters, are used in the examination of the acuteness of vision.

Though generally employed, letters as test types are open to more than one objection.

I. To begin with, they cannot be used for the illiterate, and they are more easily recognized by those accustomed to reading than by those who read little, or to whom letters of the given form are not familiar.

For the illiterate, other signs, some in the form of an **E** and some in that of a square in which one of the sides is wanting, are therefore in use. But the unit of measure is evidently not the same for these two signs, nor is their visibility the same as that of the letters.

2. Some letters are much more easily recognized than others—**A**, for instance than **B**, **O** than **M**, etc.

3. The recognition of letters is a more complicated process than might at first be thought, a process in which light sense, movements of the eyes, and, above all, intellectual functions play an important part. I need simply mention the case of word-blindness, where the acuity of vision is intact, whilst the letters are no longer recognized.

4. But the principal objection to be raised against the letters as visual tests is, that they do not answer to the definition of the acuteness of vision. We may ask, in fact, where the two points, the separate perception of which should measure the visual acuity, are to be found in distinguishing letters?

5. The square letters have given rise to another serious controversy. Several authors pointed out that the vision, measured with these test objects, should be expressed as inversely proportional, not to the height of the letter, but to its *square*. And it is certain that the promoters of the letters as test types have not succeeded in giving a satisfactory answer to this objection. Snellen replies, for example, that "the act of vision, which concerns the recognition of letters, is a compound function, measured partly by linear and partly by square measure."

This being the case, the conclusion to be arrived at is, that the function, determined by the recognition of letters, is not, properly speaking, the acuteness of vision, which is defined by the separate distinguishing of two points or lines, a measure essentially *linear*.

After many experiences and considerations, which would be too long to explain here, I believe to have found a very simple means to solve the problem, and to replace the old and defective method of determining the visual acuity by a rational, precise and correct method.

I choose, as a test-object, a black circle or ring, the thickness of which is equal to one-fifth of its diameter. The circle is interrupted by a gap, limited by parallel lines, the distance between which is the same as the thickness of the ring.

This gap or break becomes the test object for determining the acuteness of vision. In fact, we have only to determine the longest distance at which a person is able to make out the interruption in the circle, and the width of the gap (I), divided by the distance (D), is equal to the tangent of the angle that measures the visual acuity, being inversely proportional to it.

Thus, the visual angle $= \frac{I}{D}$, the acuteness of vision $V = \frac{D}{I}$.

One sees that, in this way, we proceed absolutely in con-

formity with the definition of acuteness of vision. The black, that lies on either side of the gap, corresponds to the two points the distance between which is inversely proportional to the visual acuity. Nobody will object, of course, that with our method the acuteness of vision should be expressed arithmetically, and not geometrically, because our test-object resembling a **C**, occupies a certain surface like other letters. With us, it is not the whole space occupied by the figure, but only the two sides of the gap, that constitute the test-object.

In fact, it is not a surface, but a black circular line, interrupted somewhere, which we use. Instead of a curved line, we could just as well have chosen a straight one, and no one would have thought of observing that we deal with a surface. Only, it would have been much more difficult for the patient to indicate the interruption in a straight line, than in a circle.

One single object of this sort would be sufficient to determine the acuteness of vision. In order to vary the visual angle, one would vary the distance, and, in order to change the form of the object, one would only turn the ring so as to give the gap another direction. In order to exclude the person under examination from guessing the situation of the gaps, we have but to change the position of the ring. We shall see later, that we proceed in this manner, when the acuteness of vision is very weak. But, in order to simplify the procedure for the high degrees of visual acuteness, I have drawn, on a card, a certain number of my circles of different sizes and of various directions.

The person examined is asked to indicate, by word or sign, the direction in which the circles are broken.

In order not to render the test types too dissimilar to those usually employed, I have given to the circles the same thickness as the corresponding letters in Snellen's types. But the black in my types is constant, while that of the letters varies, for example, in the proportion of 3 to 4 for an L and an E.

I have chosen the dimensions in such a manner that, placed at a distance of 5 metres, they correspond to the following degrees of visual acuity: 0.1 0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.25, 1.50, 1.75 and 2.

Fortunately, the decimal fractions correspond admirably with the requirements of ophthalmological practice, where small intervals between the tests for the high degrees of visual acuteness, large ones for the lower degrees, are desirable.

The normal or mean acuteness of vision ($V=1$) corresponds, as hitherto accepted, to a visual angle of one minute. For those who would like to use my test-types at any other

distance than 5 metres, I give here the distances, at which the different numbers appear under an angle of one minute :

0.1 =50 metres.	0.8 =6.2 metres.
0.15=33.3 "	0.9 =5.5 "
0.2 =25 "	1 =5 "
0.3 =16.6 "	1.25=4 "
0.4 =12.5 "	1.5 =3.3 "
0.5 =10 "	1.75=2.8 "
0.6 = 8.3 "	2 =2.5 "
0.7 = 7.1 "	

The degree corresponding to the visual acuity will always be found by dividing the distance D' at which the individual distinguishes the sign, by the distance D at which it is discerned by the normal eye.

$$V = \frac{D'}{D}$$

One of my cards contains, besides the fifteen different sizes of the test-type, a radiating figure for determining astigmatism.

Notwithstanding the great number of degrees than can be tested with these cards, they are of relatively small size, one measuring only 27 cm. square, the other 27 cm. wide to 40 cm. high. In fact, examination by letters requires a great number of test-types for each degree of visual acuity, owing to the difference of visibility of the letters, and the ease with which they can be committed to memory. With my type, one sign suffices for each degree. One has only to vary the direction of the card to change the position of all the gaps.

These tests can also be shown in a mirror, without requiring reversed printing.

Our test-cards are square, or nearly so, and not oblong, as the ones generally in use. This shape allows a more uniform illumination with constant artificial light and a reflector.

But the greatest advantages which, I think, can be claimed for these test-types are, that they realize, much better than letters, the principle of the acuteness of vision, the determination of the "minimum separabile," that they exclude, as much as possible, intellectual functions, and that, being themselves uniform and the same for the illiterate as well as the educated of all nations, they represent a true unit, the essential and fundamental condition for every measure and every examination.

The fifteen different degrees of acuteness of vision, that can be determined with the cards mentioned, are quite sufficient for ophthalmological purposes.

Besides these *complete* test-cards, I have constructed a *reduced* and easily portable one. (Fig. 1 and Fig. 2.) It consists

of two discs of cardboard of 14 cm. of diameter. They are united by a short ribbon and can thus be folded together, in order to occupy the smallest possible space.

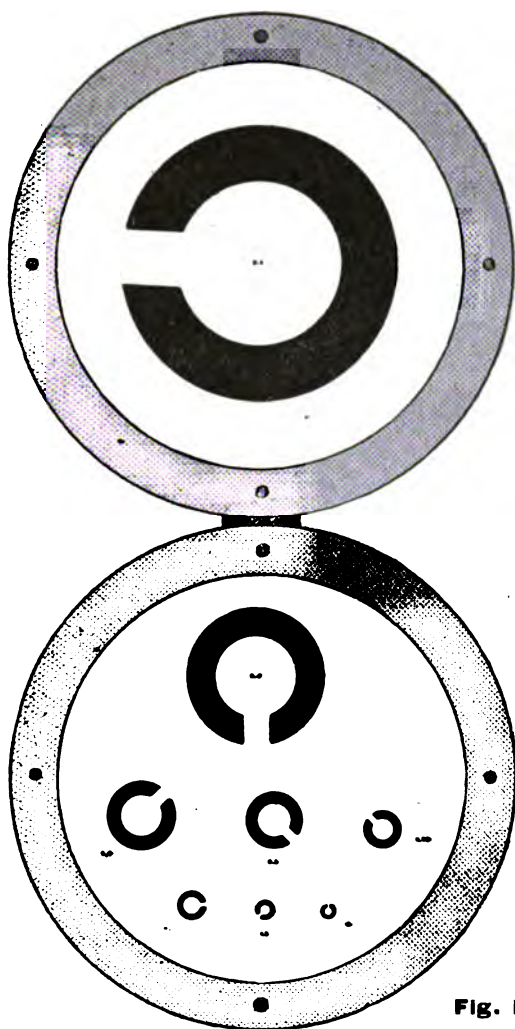


Fig. 1.

One of the discs contains only the largest of my rings, that which, at five metres, corresponds to $V=0.1$. (Upper part at Fig. 1.) It serves also to determine the acuteness of vision when it is less than one-tenth. In this case, the card is moved toward the patient, until he is able to recognize the gap in the largest circle.

The corresponding visual acuity is then:

For 5 metres	= 0.1
" 4 "	= 0.08
" 3 "	= 0.06
" 2 "	= 0.04
" 1 "	= 0.02
" 0.5 "	= 0.01

In other words, the acuity of vision is equal to twice as many hundredths of the normal, as the distance expressed in metres.

For determining low degrees of visual acuity, this method is just as simple as counting fingers, but is much more accurate.

In fact, in varying the direction of the gap, we exclude guessing entirely.

The other disc (Lower part of Fig. 1) contains the rings for $V=0.2, 0.4, 0.5, 0.75, 1, 1.5$ and 2 .

Unfolded, as shown by Fig. 1, it may be hung on the wall. A figure underneath, so small that it cannot be seen by the person under examination, indicates the visual acuteness corresponding to each ring, for a distance of five metres

The number 0.75 has been chosen especially for army and navy use, where it is often a question of a visual acuity of three-fourths (0.75), whilst this number is lacking in most of the test-types in use.

The numbers which surpass the normal or mean acuity: 1.5 and 2 , are useful, not only in civil practice, but also in the army and navy. In fact, Dr. Steiger, of Zurich, has found that the best Swiss marksmen are found among those having the greatest visual acuity. On the other hand, it cannot be a matter of indifference for a pilot to possess a visual acuity of $1, 1.5$ or 2 .

To vary the direction of the gaps, the discs have four holes at their edges, which enable one to put them on the walls in as many different positions.

On the back of the two discs are the directions for their use, in English, French, German and Italian. (Fig. 2.)

The text is printed in characters of six different sizes: so it can be used for testing the acuteness of vision at short distances.

The complete as well as the reduced test-card can be had at Mr. C. F. Hausmann's, St. Gallen (Switzerland.) Price per sheet of the complete card, $12\frac{1}{2}$ cents; pr. 5 sheets, 50 cents. Price for one sample of the reduced card with a protecting cover: 24 cents, for 5 samples, one dollar.

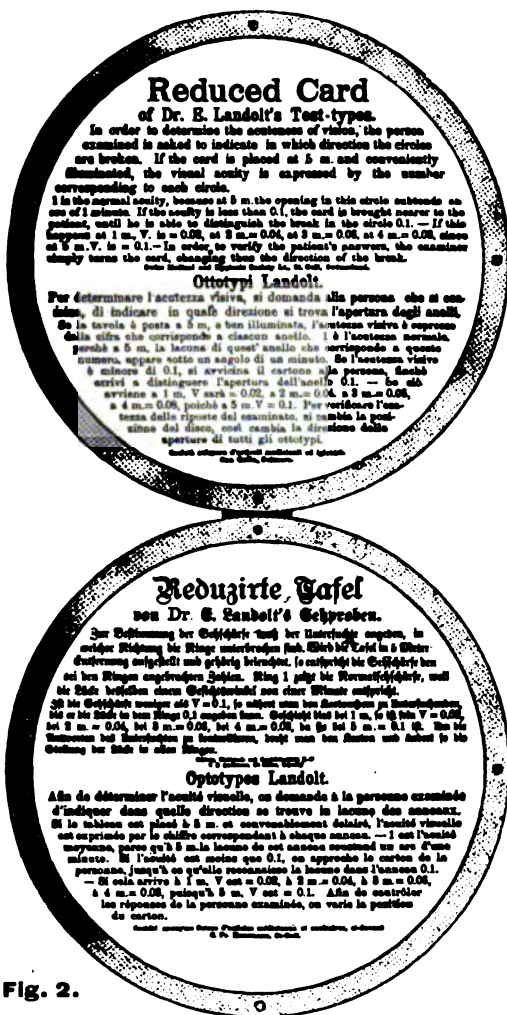


Fig. 2.

The figure shows E. Landolt's *reducea* test-card in half its size.

EVISCERATION WITHOUT NECESSITY OF WEARING ARTIFICIAL EYES.*

BY J. G. HUIZINGA, M. D.,

CHICAGO.

To obtain the most perfect and satisfactory results where evisceration is permissible has been the aim of a series of experiments on dogs. The first result was the adoption of an operation called eviscero-neurotomy and published in the Journal of the American Medical Association of February 17, 1900. This, however, has been changed and modified from time to time, until at the present the following method is pursued:

Having introduced a speculum and taken the ordinary precautions to guard against infection, the eye is drawn inwards and upwards as far as possible so as to expose the external inferior quadrant. With a small scalpel the sclerotic is pierced about a quarter of an inch posterior to the sclero-corneal margin and just below the insertion of the external rectus. This incision is carried backwards meridianally up to the entrance of the optic nerve. The cornea is not amputated but left intact. The contents of the eyeball are carefully removed and its interior thoroughly cleansed. I find that an ordinary eye speculum introduced into this wound assists in keeping its edges apart and greatly facilitates the work. A circular section of the posterior portion of the sclerotic, just large enough to include the optic and ciliary nerves, is then removed through the opening in the globe and the end of the nerves amputated. After all hemorrhage has ceased, a fenestrated metal ball, the largest size that can possibly be accommodated, is introduced. The edges of the wound in the

*This paper was originally prepared to be presented to the Section of Ophthalmology of the American Medical Association last summer, but owing to the imperfect results obtained in some of my experiments, I decided to wait. The recent appearance of Dr. Gifford's article, however, induces me to publish my experiments now while the interest in the subject is yet high.

sclerotic are closed with catgut sutures, which are covered by the conjunctiva being drawn over them and sutured with black silk.

The local reaction is comparatively slight. The cornea soon loses its characteristics and becomes lusterless and opaque. In about six or eight weeks after the operation the cornea is tattooed so as to resemble as nearly as possible a normal eye:—i. e., the center of the cornea black to resemble a pupil, and around this circle of such color as may harmonize with that of the iris of the other eye.

The results have been fairly satisfactory and have encouraged the hope that it may be possible to remove as much as may be necessary in an offending organ and yet retain a fairly presentable eye without the necessity or inconvenience of wearing an artificial shell. In size the globe decreases a little. The sclerotic remains slightly congested, for a time, giving the appearance of an inflamed eye. Subsequent enucleation has shown that the interior of the metal sphere became filled with new tissue entering in through the opening in the posterior part of the sclerotic and through the fenestrae of the metal ball. The operation has been demonstrated several times during the past year before sections of students of the Post Graduate Medical School.

Anesthetic used: Dogs take chloroform very poorly. A comparatively large per cent dying on the operating table, induced me to depend entirely on local anesthesia administered as follows:

A 4 per cent solution of cocaine is dropped on the cornea sufficiently often to obtain complete anaesthesia. With a hypodermic syringe having a rather long needle, from five to ten drops of a 2 per cent solution was then injected into the orbit back of the eyeball in the vicinity of the ciliary nerves and ganglion. I would advise this in the human being where a general anesthetic cannot be administered. The result is a sufficiently thorough anesthesia of the contents of the entire orbit to perform any ordinary operation. It has the added advantage that the animal will not roll around in the straw or saw dust of his cage after the operation, as he almost invariably does after taking a general anesthetic, and thus largely prevents the danger of septic infection, which has always been the bete noir of ophthalmic operations in lower animals.

Conclusions:—1. Slight local reaction. 2. No danger from sympathetic inflammation. 3. Artificial eyes not necessary.

4. The maximum in results by the removal of the minimum of tissue.
5. Perfect movement of the organ in every direction.
6. An improved method of using local anesthetics for extensive operations in the orbit.

100 State Street.

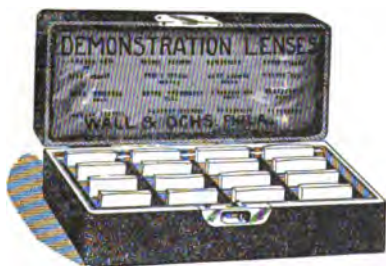
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BY CHARLES A. OLIVER, A. M., M. D.,

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GEON TO THE PHILADELPHIA HOSPITAL, ETC.

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THE ECONOMIC VALUATION OF VISION *

(PRELIMINARY PAPER)

By H. V. WURDEMAN, M. D.,

MILWAUKEE, WIS., U. S. A.

PROFESSOR OF OPHTHALMOLOGY AND OTOTOLOGY AT THE MILWAUKEE
MEDICAL COLLEGE, ETC., ETC.,

WITH THE COLLABORATION OF

DR. H. MAGNUS,

OF Breslau, Germany,

PROFESSOR OF OPHTHALMOLOGY IN THE UNIVERSITY OF Breslau,
ETC., ETC., ETC.

INTRODUCTION.

For several years I have been particularly interested with the subject of Visual Economics, my attention being directed to it by the work of Prof. H. Magnus of Breslau, Germany, on "Leitfaden für Begutachtung und Berechnung von Unfallsbeschädigungen der Augen."

By his methods for determination of the percentage of economic damage to the individual following accidental injuries to the eye, I am convinced that a correct estimation of the effect of the injury upon the earning powers may be obtained. This factor being determined by a properly carried out professional examination and by a scientific adaption of the other factors relating to the particular case, a basis for settlement may be fixed and thus the almost hopeless confusion of the subject and empiric methods now existing in the courts may be relieved.

The literature is scanty and almost entirely German; with the exception of notes scattered here and there throughout the literature of law and medicine, there is nothing in English dealing specifically with the subject with the exception of Hansell's essay (17) given before the Ophthalmic Section of the American Medical Association, 1900 (2-50). The only treatise is that of Magnus, published 1894, in Germany, and

*Read before the joint meeting of Chicago Ophthalmological and Otolological Society and the Medico-Legal Society of Chicago, Feb. 12, 1901.

the work now in press on "Visual Economics," in which Prof. Magnus and I have exhaustively treated the subject. In the following I present our views in a condensed and practical form; for full consideration reference should be made to our book.

BASIS FOR SCIENTIFIC VALUATION.

In dealing with the valuation of quantities, powers or functions which have varying values in different individuals, we are forced from beginning to start with certain axioms that are in themselves expressions of averages; these may only be properly used if they have been obtained in a scientific manner by the results of examinations of large numbers of individuals. In this manner the unit for measurement of machinery, the horse power, has been obtained: It is known that horses vary in strength, but science has taken as its standard the strength of the average horse, which can lift 33,000 pounds one foot in one minute. The wages of a day laborer may fluctuate from \$0.50 to \$5.00; yet, for scientific purposes, we might express his average earnings at the rate of \$2.00 for a day's work. For both scientific and practical purposes we are enabled to utilize mathematical equations for the calculation of the results of certain damages to standards which have been evolved from such average estimations. Another axiom which must be accepted is the supposition that in professions and trades requiring eye sight, a blind person is totally incompetent to work. The possession of good functional powers, especially vision, is the principal factor for full earning ability. We even consider that the earning ability for any gainful vocation requiring eye sight, is practically synonymous with the visual earning ability, and that injuries to the eyes affecting the vision have a direct detrimental effect upon the earning capacity of the individual. It is fortunate that the state of ophthalmic science allows of a definite expression of the working powers of the eye, and of a proper valuation of the factors entering into vision. The economic loss of an arm or leg or the loss of the sense of smell or hearing cannot be as exactly estimated as that of the loss of the sense of sight. An injury to the former, but partially and temporarily affects the earning powers, whereas good vision is one of the chief factors in personal economics, for gainful occupations may only be followed when the sense of sight and mental faculties are unimpaired. The loss of visual power invariably has a deleterious effect upon the calling, depending upon the degree of damage and the nature of the vocation, which may be shown in dollars and cents. In determining the amount of damage following an accident, the only factor that can be

fixed with scientific exactness, is the actual loss to the earning ability, and this should be the principal basis for settlement of all claims.

PRESENT EMPIRIC METHODS USED FOR SETTLEMENT OF DAMAGES.

As is well known the measure of damages is a matter which is now empirically settled by the courts. The injury or loss or which compensation is set is sometimes given "nominal" damages; in other cases "substantial" or "compensatory" damages:—the monetary amount being arbitrarily fixed by the courts after weighing the evidence. There is no scientific estimation of the economic damage. American courts allow the amount actually expended in the necessary treatment following the accident, the monetary valuation of the time lost, the amount of injury to the business of the individual and for the mental effect, pain and anguish suffered by reason of the accident. A third form of damage is given as a kind of punishment to the defendant, this exceeds the loss actually sustained.

The estimates made by the accident insurance companies are likewise based upon empiric ideas and the results of experience (17). The same may be said of the United States Bureau of Pensions. A great step in advance as regards the legal, medical and ethical aspects of the subject was made in Germany when in July, 1884, there was passed an accident insurance law by which compensation for the loss resulting from bodily injury or death is fixed according to the following (18):

1. The cost of the necessary treatment commencing at the beginning of the 14th week after the accident.

2. A regular income to be paid to the injured person from the beginning of the 14th week during the time of his inability to work.

From this law as a basis, there has arisen a method of settling indemnity claims and of giving pensions for injuries by which the amount of the monetary compensation is made proportional to the amount of the bodily injury, or in other words, the effect of the accident upon the working powers of the individual.

We have certain scientific standards by which the various factors composing the sense of sight may be accurately measured. These factors have been reduced to mathematical elements, in a working formula by Prof. Magnus of Breslau, Germany, to which I have given considerable study, and by which I am convinced that a scientific estimate of the econo-

mic damage to vision in the case of eye accidents can be made in every case, by which a just and equitable amount of indemnity can be estimated.

STATUS OF THE PHYSICIAN IN RELATION TO ESTIMATION OF ECONOMIC DAMAGE AND INDEMNITY.

The question of by whom this estimate should be made may perhaps be taken up here. The average physician is an educated man, who is not only competent to judge of the nature of the injury, but of its relations to the earning capacity. The physician acquires a certain knowledge of the peculiarities of the different trades in his daily work, as there are but few vocations with which he does not come in contact. Of what use is it to tell a jury that a certain person has suffered from paralysis of the *musculus rectus externus sinistra*?—Technical physiological knowledge is certainly needed to judge of the relations between the laming of an ocular muscle and its effect upon the person's work, and verily we cannot expect the tradesman or the average citizen to have a scientific mind. It is the province of the physician to estimate the proportional loss to the earning ability resulting from disease or traumatism. The question of monetary compensation may be left to the business corporations and the courts of law after the opinion of the physician has been expressed.

DEVELOPMENT OF A MATHEMATICAL FORMULA FOR ESTIMATION OF ECONOMIC VISION ACCORDING TO THE METHOD OF MAGNUS.

During the last few years a number of different propositions for the estimation of the economic value of vision have been proposed, most of them based upon empiric and unscientific grounds. I have been convinced, by much study of the subject, that the rules and formulas proposed by Magnus, are correct, and that by his methods we may arrive at a definite and satisfactory estimate of the relation of ocular injuries to the earning ability. I am not of Hansell's opinion that the complication of the subject, by reason of its compound factors and the endless uses put to them (on account of the variety of professions, trades and occupations that go to make up the sum of the world's business), renders their expression in a formula applicable to but a limited class of cases: (17) I am convinced that the rules which follow are applicable to nearly all of the professions and trades. True, there may be many exceptions, but I know that our methods are equal if not

superior to most of those used by the practical sociologist and more accurate than many of the dogmas accepted generally by science.

If in a given case we may desire to mathematically determine the amount of power of any bodily function, we first have to find a general expression for the normal ability of the organ. We have determined such expression by taking the average of a large number of measurements of the particular function and designate this average as an expression of the normal powers. In this way we have formed the standard of visual acuity, of the visual field, of the normal light and color sense, etc. Starting from this average value, we measure the power of the organ in any special case. The difference between its power and our standard is a fraction, which in the case under examination may represent the amount of damage done to the function. This we do in the estimation of the pathological diminution of central visual acuity and with limitations of the visual field. When we succeed in creating such an average normal value for the functional ability of an organ, we can then estimate the amount of individual acts as if measuring a piece of cloth with a yard stick. This method is used in the other natural sciences as well as in medicine. Therefore, we must first fix an expression for the normal ocular earning ability before we can estimate the amount of individual cases.

If we can conceive of an injury to the earning ability as a quantity which may be given a mathematical value, we would have to start from an estimation of the complete earning ability, which in a healthy normal individual is a composite quantity resulting from three factors: (1) The unimpaired functional power of the bodily organs. (2) The technical knowledge which is necessary for the carrying on of the vocation. (3) The ability of the individual to compete in the labor market.

These elements cannot be regarded as equal in value. Doubtless the functional condition of the bodily organs is of the utmost importance for successful work; the preparatory education or knowledge being of nearly equal value. Of much less importance is the third element, the ability to compete in the labor market, as this depends upon the value of the two others; for the ability of an artisan to battle against competition depends largely upon the condition of his health and his technical knowledge.

This conception of the earning ability allows us of putting it in a mathematical formula, designating the earning ability itself, E ; the first of our elements, the functional ability, F ; the second, the necessary knowledge, V ; the third, the ability

to compete, K . In this formula we put the two quantities, F and V , in their full value and accept K as a root value, there being nothing changed in the total value of the formula, because the root of 1 is always 1. This proportion immediately changes when the part introduced as a root grows smaller than 1, (which happens in each ocular injury), because the root value of a genuine fraction is always greater than the fraction itself. Thus the influence of K after being intro-

duced as a root value, if it has fallen by an injury to $\frac{K}{z}$ cannot be any more $\frac{K}{z}$ but must be greater, for instance, $\frac{2K}{z}$.

Therefore, the damage to the total value of the formula will be smaller if we take K as a root value. We will have to choose the exponent of the root as smaller or greater according to its rating. Therefore, if we wish to lower the total value, we take a smaller exponent; if we wish to affect it less, a greater exponent. Therefore, in the case of minor ocular injuries where the ability to compete, K is comparatively little impaired, we would suit these conditions by choosing for this case a greater exponent of the root—and here we commence to be arbitrary—we would adopt in the case of slight ocular injuries for K as $^{10}\sqrt{}$, and for serious ones, according to the visual demands of the vocation as the $^7\sqrt{}$ or $^5\sqrt{}$.

When we express the earning ability through the three factors, F V and K , we should represent E not as a sum, but as a product of these quantities, thusly: $E = F \times V \times \sqrt[x]{K}$ in which the exponent x changes with the degree of the functional damage. If we should have added F , V and K , the formula would give wrong practical results, for: Supposing both eyes were lost in an accident, the quantity F of our formula would be 0, which we would subtract from the formula leaving a remainder $V + \sqrt[x]{K}$; which would be entirely wrong, as a laborer losing his functional ability, especially the sense of sight, should be regarded in an optical way as entirely unable to earn. Taking the same example and using our formula with $F = 0$, E immediately becomes 0, because each product always equals 0 if one of its factors is 0. If we would leave V out of our formula, E , of course, would $= 0$. Actual experience confirms this:—even the most simple handwork requires a certain amount of preparatory education. Finally if we drop the third factor $\sqrt[x]{K}$, according to our formula, the normal earning ability becomes 0; which is

likewise shown by experience, for even if the individual be in good health and knows how to work, if he is not needed, his economic value becomes nil, as he only has earning ability when he can dispose of his work in the economic market. If we take away the ability to compete, it leaves the remainder, $E = F \times V$, which is the working ability, but it needs the addition of the factor $\sqrt{K}$, the ability to compete, to produce the full earning ability. Thus our calculation of injury to the earning ability starts from the formula:

$E = F \times V \sqrt{K}$, which is the full earning ability.

When one or more of the factors forming the earning ability is injured an idea of the amount of damage to it may be formed if we first consider to what extent the single factors are injured. We will find that the application of mathematics to this subject will prove somewhat complicated, as we will first have to separately estimate the damage to the different factors, and then fix the value of the total formula. The act of seeing, F , of our formula, as we will see directly, consists of three separate parts, each of which may be damaged in a different way, and thus to ascertain the value of the factor F , we have to solve three mathematical problems, but in return our method of estimation allows us to give a mathematical expression to the different forms of damage in an accurate manner with due consideration of the different individual conditions in question. In order to simplify our formula, we may leave out the factor V , the preparatory education. As important as this may be to the normal earning ability, we may put it aside in the case of accidental damage, for the technical education itself will not be injured directly. Certainly the visual function may be diminished to such an extent that the realization of the technical knowledge may become limited, but this injury to the earning ability in such a case does not rest upon the diminution of the knowledge and capacity, but upon a limitation of their use. We calculate the extent of such limitation directly from the factor F , from the performance of the visual act, which is the essential factor in the full earning ability, damage to which is synonymous with damage to the total. In calculating F we have already used V . For simplicity's sake, it would be better to omit V entirely; the working formula for the earning ability then would be $E = F \sqrt{K}$, or in other words, the earning ability is composed of the factors of the functional power and the ability to compete.

ESTIMATION OF DAMAGES TO ECONOMIC VISION.

Normal physiologic vision consists of a series of different factors: The central acuity, the visual field, light and color sense, the adaptive faculty, the muscular movements and cerebral processes, all acting together in creating the sense of sight. We may, therefore, regard the act of seeing as a sum whose numerals are formed by the different functions; if one numeral be taken from the sum which represents the complete act of seeing, then a balance will be left and vision will be damaged to the extent of the loss of one function, but in a limited way it is yet in existence. In the manufacture of a formula for physiologic vision we have to consider that in losing simultaneously the two most important factors, central and peripheric vision, the act of seeing would be nil; but in the estimation of economic vision we have to use a different method, for the different secondary functions forming sight have different valuations. In calculating injury to the visual earning ability, we have to exclude cerebral vision because accidental injuries to the cerebral centers alone are hardly possible. The sense for light and color and that of adaption are not of themselves to be considered in estimating accidental damage to the ocular seeing ability. An injury limited exclusively to these functions is not known; theoretically they are possible, but practically they are not recognized, and if they occur they would be connected with disturbances of other parts of the visual act, especially the visual acuity and the visual field; therefore, we include the functions of the light and color sense, and of the adaptive power, when we take the central visual acuity, the visual field and the muscular movements. These are to be regarded as factors of a product, and multiplied; none of them could be left out, for without them the earning ability would disappear. If a person loses his central acuity, we certainly have complete earning disability, for a large central scotoma certainly causes economic blindness; total paralysis of the ocular muscles would keep the eyes immovable and prevent work. Great contraction of the visual field, so that only central vision would be left, certainly prevents the person earning anything by the aid of his eyes.

In building up a formula for the act of seeing in relation to earning, we denominate the central acuity with the letter C, the visual field with P, and the muscular motions with M. The central acuity, C, is under all circumstances the most important element; any injury which reduces it below the lowest limits required in the profession, produces complete disabili-

that work. Peripheric vision is of less importance and tends to it have a smaller influence to the entire act of vision; therefore, while we treat C as a whole number, we reduce P as a root value. The same is the case with the action of the muscles, but even to a greater extent, as they are much less important than even the visual field, therefore, we take the action of the muscles as a root value in the formula, and make the exponent of this root to be much greater than the exponent of the root value of the visual field.

In the formulation of our formula we treat the factor of the muscular movements in a different manner when treating of binocular vision than we do for the monocular act. In the formula for binocular vision we take the muscular movements of each eye as a product of different factors, each of which corresponds to the activity of a particular muscle; now, we mark the muscles of one eye with $(m_1 m_2 m_3 m_4 m_5 m_6)$, those of the other as $(m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)$, we represent the whole muscular activity as $(m_1 m_2 m_3 m_4 m_5 m_6 m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)$. In this conception, by losing a single muscular motion, the product would become 0 and, therefore, the binocular act would be negative. Thus our formula for the binocular act of vision would be $S_2 = C \sqrt{P}$

$\sqrt{(m_1 m_2 m_3 m_4 m_5 m_6) (m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)}$. The monocular field of vision is 1-6 smaller than the binocular, therefore, in the monocular act the visual field is taken as $\sqrt[6]{P}$. The extraocular muscles have a smaller value in the monocular form of vision than in binocular, because those relations of the outer musculature of both eyes that are essential in estimating distances and the relations of objects are missing. Therefore, we here consider the value of the musculature as less and estimate it as 2-3 of the binocular value. The factors of the individual muscles bear a different relation; if only one eye is used and one muscle becomes paralyzed, the monocular act still exists, and is not destroyed by the distance, we would only lose the work of one muscle; therefore we put the muscles in the formula in the form of a sum. Our formula for the monocular act of vision would be:

$$C \sqrt[5]{P} \sqrt[4]{V^{2/3} (m_1 + m_2 + m_3 + m_4 + m_5 + m_6)}.$$

ECONOMIC LIMITATIONS OF THE CENTRAL VISUAL ACUITY.

The central acuity lies within well-known physiologic limits. When it falls below these, the function itself is damaged.

aged; but the conditions met with in practice are not such that the physiologic and earning limitations of the central visual acuity are interdependent;—for instance; science calls an individual blind only when perception of light has entirely disappeared, but in actual practice, he is blind if the faculty of sight has been weakened to such an extent that the organ of sight cannot be used to earn a living. Thus the meaning of blindness as used in daily life is much narrower than that of science.

Now and then extremely great demands may be made upon certain organs which may reach to its highest ability. In actual practice we are satisfied with the amount of labor which does not strain the powers. There is hardly any vocation which demands the extreme limit of sight (according to scientific figures), as a condition of success, and in each vocation a great many individuals may be found who have comparatively poor sight, but the same earning ability as those with normal eyes. Neither the lowest nor the highest points of scientific visual acuity correspond with those used in business; the lowest point of the latter is not as low as the lowest laid down by science, while the highest point of the functional range that may be regarded as normal, must be considered below the highest scientific limit.

Certain estimations of the working acuity have been made from experience, and thus, we have determined that ordinary coarse work, such as that of a farmer or day laborer, does not require more than one-half the normal as a condition of success; for instance, if a day laborer would suddenly have his vision reduced to not more than 0.50, he would be able to go on with his work, but if a skilled mechanic would suddenly lose this amount of vision, he would have to stop, as he is used to work with clear retinal impressions, but if he would only lose $\frac{1}{4}$ of his visual acuity, he would yet be able to do all his work. If the common laborer's vision should drop to less than 0.05, he would be blind for all working purposes, and the same be said of the skilled artisan if his vision drop below 0.15. Therefore, out of these four limit values we construct two ranges within which the professional or economic limits may lie. One of these ranges would have as its highest limit 0.75 (3-4), as the lowest 0.15 (1-7), while the other range would be between 0.50 (1-2) and 0.05 (1-20) of the normal scientific standard for visual acuity. It is not necessary that the maximum and minimum limit values exist in both eyes. It is sufficient that they may be shown in one eye, the other

ing a lesser acuity than that which we have declared as absolutely necessary for professional demands. (See 1-24-25-39-41-52). According to this standard we submit tables which divide the followers of the different manufactures into two groups:

TABLE A.

The various trades and professions arranged according to their visual demands.

GROUP 1.

Trades requiring higher degrees of visual activity. Range 0.1 to 0.15 (scientific standard).

The higher professions.

Medicine.

Theology.

Law.

Art.

Engineering.

Students of all professions.

Fine mechanics.

Iron and steel workers.

Rolling-mill workers.

Machinists and metal workers.

Precious metal workers.

Musical instrument makers.

The linen industry.

The textile industry.

The silk industry.

Paper workers.

Leather workers.

Garment makers.

Printers.

Marine employees.

Mine workers.

Railway and steamship employees (including city roads).

Soldiers and sailors.

Telegraph operators.

Skilled labor generally, etc.

GROUP 2.

Trades requiring lower degrees of visual acuity. Range 0.05 to 0.1 (scientific standard).

Glass blowers.

Mine workers.

Quarry men.
Builders.
Pottery makers.
Brick makers.
Workers in mechanical industries.
Employees in gas and water works.
Paper makers.
Wood workers.
Mill employees.
Manufactures of food articles.
Sugar factory employees.
Brewers and maltsters.
Tobacco workers.
Chimney sweeps.
Street railway employees (horse cars).
Employees of elevators and wine cellars.
Teamsters.
Bargemen on inland waters (rivers, etc.).
Farmers, etc.
Day laborers, etc.
Unskilled labor generally.

Individual members of certain trades do not have exactly the same visual demands made upon them. We must remember this fact and not judge all the members of the same trade by the same standard. It is advisable to reach some definite agreement as soon as possible, as hitherto there has been a disposition among oculists to consider full visual acuity according to the scientific standard as the basis for the valuation of the conditions met in practical life. If the estimation of the results of the amount of damage arising from ocular injuries is to be made in a just manner, according to actual conditions, this custom must be abandoned.

Our views regarding the difference between the scientific and working standards of visual acuity can claim far more extensive practical consideration than that which relates alone to the subject in hand of ocular injuries. All professions or vocations which make admission dependent upon a degree of vision would do well to remember that practical visual acuity and that of the scientific standard are entirely different things, and that an individual who by the scientific standard shows a deficit, may have, for working purposes, a full amount of vision. Magnus' suggestions have been accepted since 1893 in the Breslau Railroad Company. Their requirements do not now include "normal" acuity of vision by the scientific standard, but only "sufficient visual acuity." The same

ditions have been met with in a similar manner in other
 tions of Germany. In America the tendency is to de-
 d the highest visual qualifications from prospective rail-
 employees; the full scientific standard, 1,0 (20-xx), be-
 required by many railroads and being deemed as essen-
 by the consulting oculists of the principal systems. (1-52.)
 llport¹ recently inquired into the conditions existent in the
 United States relative to the vision required of railway
 oylees, and comes to the conclusion that it is well to di-
 these employees into two classes: Class A, in which
 vision should be at least 20/xxx (0.66) in one eye and
 xl (0.50) in the other; class B, in which the vision should
 at least 20/xl (0.50) in 1 eye and 20/l (0.40.) In the first
 s are to be put: Engineers, firemen, brakemen, conductors,
 chmen, signalmen, switch-tenders and engine dispatchers.
 class B: Track foremen, bridge foremen, crossing flagmen,
 ge tenders, gatemen, train baggagemen, telegraph opera-
 , station agents and station baggagemen. Many roads
 ire much higher qualifications. We are, however, fast
 ing to the conclusion that a practical working or economic
 on should be required for new men, i. e., 0.75, and that
 y should not have any grade of refractive error which
 ould ultimately render their distant vision poor without
 ses. The following table shows the scientific standar
 the visual acuity converted into economic terms:

TABLE B.

The scientific standard for visual acuity converted into eco-
 nic terms:

I	0,50	I
0,9166 . . . 11/12	0,45	0,8888 . . . 8/9
0,8333 . . . 10/12	0,4 ⁰	0,7777 . . . 7/9
0,754 . . . 9/12	0,35	0,6666 . . . 6/9
0,6666 . . . 8/12	0,30	0,5555 . . . 5/9
0,5833 . . . 7/12	0,25	0,4444 . . . 4/9
0,500 . . . 6/12	0,20	0,3333 . . . 3/9
0,4166 . . . 5/12	0,15	0,2222 . . . 2/9
0,3333 . . . 4/12	0,10	0,1111 . . . 1/9
0,250 . . . 3/12	0,05	0,000 . . .
0,1666 . . . 2/12		
0,0833 . . . 1/12		
0,000		

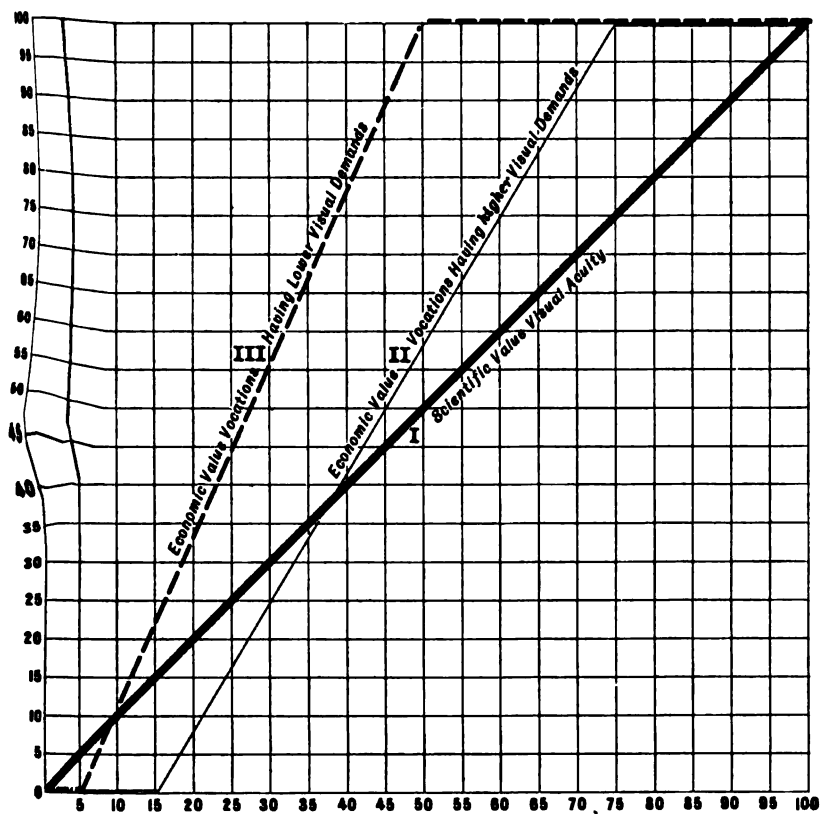
calculating the amount of economic damage from ocular
 ents the visual acuity should always be estimated from
 economic standard. This may be readily done by the
 of the above table, or by marking the economic values
 ur ordinary Snellen test cards. If we desire to person-

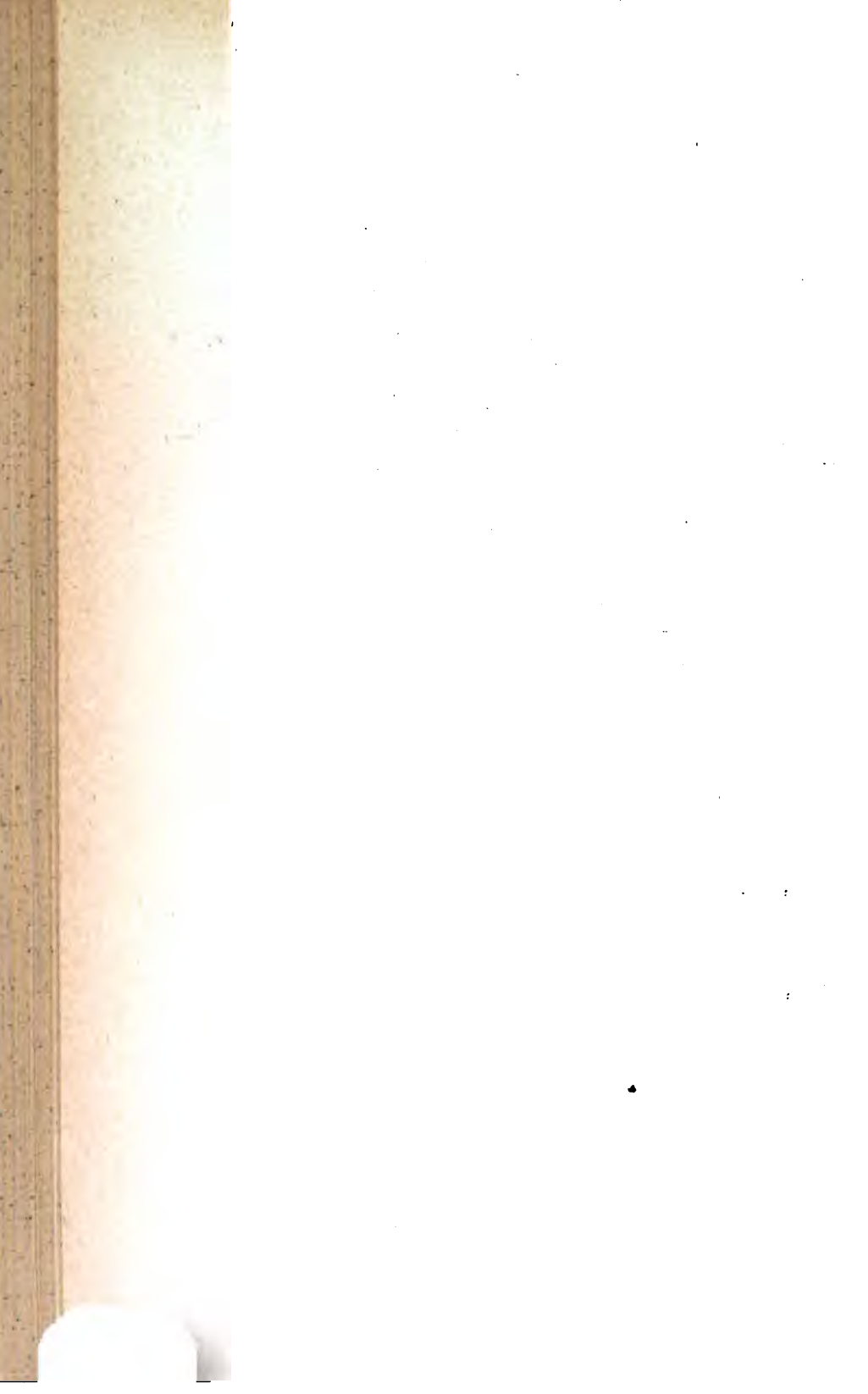
ally estimate the economic valuation of certain visual acuities found by the scientific measurement, we may use the accompanying chart.

We show, figuratively, the relations between the scientific and the economic visual acuities in Plate I. In this drawing the degrees of vision in the absciss and the ordinate axis are marked at intervals of 0,01, so that five of these are always taken together; the absciss as well as the ordinate axis are divided by this into 20 equal parts. The curve of the scientific visual acuity is marked as a coarse black line (I) and because this progresses gradually, it has been equally divided. Economic vision will not suffer very much if the acuity falls off 0,05, because the difference between 1 and 0,95 is so little that it will scarcely be noticed. But, if the acuity falls off further, a point will soon be reached where every loss affects the working capacity, and if the vision falls below this point, for instance, to 0,005, then it has no economic value whatever, and when it reaches this lowest point and further depreciates, vision will be professionally of no importance. Corresponding with these facts, the two curves of the economic visual acuities should not be marked as grades; the beginning and end of the curves should deviate, as we have shown, but these deviations are so little that we have divided them similarly to that of the scientific standard. The fine line (II) shows the course of economic vision for higher, and the dotted (III) line for trades having lesser visual demands. As the drawing shows, both curves start together with the absciss-axis, and then when the climax of the demands is reached, they run parallel.

THE ECONOMIC LIMITS OF THE VISUAL FIELD AND THEIR ESTIMATION.

The limits of peripheric vision are likewise to be regarded from either a scientific or economic standpoint. Peripheric limitations or even greater defects in the visual field, if existent in only one eye, will hardly impair the earning ability, and under certain circumstances moderate limitations of both the visual fields will not impair the earning capacity. We would only regard limitation of the field of vision as entitled to indemnification if the limits for white in the binocular field are temporal 70°, superior 40°, inferior 60°; and in the monocular type, temporal 70°, nasal 45°, superior 40°, inferior 65°. We would divide the binocular field into three zones, 30° each; the first from the outermost periphery to 60°; the second from 60° to 30°, and the third from 30° to the point





of fixation. In order not to complicate the subject too much, we give each of these three zones the same value and, therefore, we consider that the entire binocular field of vision, P , would be composed of three factors of equal value. According to this all defects of the field of vision could be given their numerical valuation. For instance, with the loss of one eye we lose 1-6 of the binocular field, with homonymous hemianopsia 3-6, etc. We have already noted the reasons for introducing the visual field as a root value into the formula for the visual act.

THE ECONOMIC RELATIONS OF THE OCULAR MUSCULATURE AND THEIR ESTIMATION.

The outer ocular muscles have their peculiar relations to the earning power. In view of the fact that the binocular act of vision in its earning relations may only be regarded as preserved if all the ocular muscles be unimpaired, the functional disturbance of one single muscle disturbs the binocular act, and is to be regarded in an economic sense, as the complete loss of one eye; even though it be temporary, putting the affected eye entirely out of use. In the case of monocular vision, if one muscle be affected, it is practically only a small injury, and by omitting one muscle, the action will appear in the formula as a fraction 5-6. The fact that the six outer muscles of the eye are not of the same relative value for the earning capacity is also to be considered depending upon the trades, but for ordinary purposes we value them as being equal.

THE MEANING AND ESTIMATION OF THE ABILITY TO COMPETE, K , OF OUR FORMULA FOR THE EARNING ABILITY.

The ability to compete has been inserted into our formula for the full earning ability with a smaller value than the other three factors. A few remarks regarding the position of this factor in the estimation of the injury to the ocular earning ability follow:

When an individual receives an accidental injury, especially that of vision, the damage to him is a double one. First, there is the impairment of his working ability by which he cannot perform as much or as good work as formerly, and second, his chances for obtaining work quickly and easily have become less. Practical experience shows that a one-eyed person not only has more difficulty in finding employ-

ment, but his visual disorder makes it difficult for him to retain that employment which he has. Workmen with normal functions are preferred by most employers of labor and not without reason. The injured person, therefore, has a right to claim not alone compensation for the impairment of his capacity for work, but also for the difficulty which he encounters in making the most of this capacity. Therefore, in estimating the impairment of the earning ability, we have always and under all circumstances to consider the diminution of the ability to compete.

This factor is to be conceived as resulting out of heterogeneous elements of which a part lies in the individual himself and is affected by the condition of his health, knowledge, etc., while another portion is beyond his control. It is this latter element the world values in judging the ability of the individual. The ability to compete in the labor market, the possibility of finding employment is fixed, therefore, by the physical and mental ability of the individual as well as by the way others judge of it. As regards the eyes, the employer will be willing to give or refuse work to the individual according to how he regards the injury of the eye as detrimental for the performance of his particular work. If we desire to state the ability as a numerical quantity, we must consider such conditions, which we can do in the following way:

The part of the ability to compete that each individual supplies by himself, in our case the ability of his organ of vision, we insert into the expression for the normal act of vision, $C = C \sqrt{P^4 \sqrt{M}}$; but in the case of accidents the impaired value the act of vision should be put in as the lowest value in the root. As the amount of the earning ability is directly fixed by the amount of the ability to compete, the latter exercises less influence upon the same than other factors, so we insert it as a root value in the formula for the earning ability.

The part of the ability to compete not depending upon the individual, in our case not only the condition of the eyes, but upon the judgment of the employer, we render by the exponent of the root which we choose for K ; taking a smaller exponent, the value would be enhanced to a less extent, and if a large exponent, to a higher extent. If we enhance the value of the ability to compete by taking a greater root exponent, as the earning ability increases as much as the ability to compete becomes greater, the earning ability will be greater according to the size of the root exponent. Therefore, if we would indicate that an employer regards a certain ocular impairment as an important diminishment of the working ca-

capacity, we would take a smaller exponent, but if we intended to show that an ocular impairment is of less importance to the employer, we would take a greater one. We, therefore, choose for all slight and moderate visual impairments the root exponent 10; if the impairment of central vision be serious, for instance, if in the case of professions with higher visual demands, it falls below 0,15, and in those with less demands, below 0,50 we would take the exponent 5 for the professions with greater visual demands, and the exponent 7 for those with less. If we think that the aesthetic differences between simple blindness of the scientific standard without injury to the looks of the eye and the loss of the eyeball or the formation of a bad looking eye, as the formation of a leucoma or a staphyloma, would be considered deleterious by the employer, we may give expression to our opinion by choosing a greater root exponent for the ability to compete in the case of simple blindness, and a smaller one where there is deformity. By leaving the selection of the root exponent to the judgment of the calculator, our formula adapts itself to the peculiarities of the individual case, avoiding thereby a rigid form and doing justice to both parties. Therefore, in forming a special estimation of the ability to compete, we first fix the amount of the injury to the act of vision in each case, upon which depends the part which the individual furnishes himself. As regards the second part, in certain cases it will be found that while there is no, or but little actual injury to the act itself, yet certain injuries to the eye disturb the relations of the individual to the employer, for instance:

A man may have his cornea burned, followed by a whitish leucoma, the visual acuity of that eye being reduced but slightly, while the other remains normal; thus, although such an individual is not optically impaired for his work, because the normal eye allows the undisturbed following of the trade, on account of his looks, the chances of his finding work have become less. In such a case we are consequently in a peculiar position of estimating an ocular impairment to the ability to compete when there is no real defect of the working vision; but we think we can meet these difficult conditions when we express the diminution of the ability to compete in all cases by the arithmetical proportion of the visual diminution of both eyes. Thus, the ability to compete will be considered a quantity almost identical with the act of vision, but not dependent upon it as the maximum of the visual acuity in both eyes. Suppose the case above quoted retains normal vision in one eye, while in the other it is diminished to 0,25,

we would express this person's ability to compete by the following equation:

$$^{10}\sqrt{\frac{1+0.25}{2}} V\bar{P}^4 \sqrt{(m_1 m_2 m_3 m_4 m_5 m_6) (m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)}$$

The reasons for expressing the formula in this form need not be entered into here, as they are rather lengthy: They are fully considered in our book upon "Visual Economics." If several of the factors be damaged at the same time, the amount of such damage should be considered by the exponent of the root. If one eye be entirely lost, the disorder of the visual act would be represented in vocations with higher visual demands as $^6\sqrt{}$, and in such with less demands as $^7\sqrt{}$. The same calculation may be done for serious disorders which have the same relations as the loss of one eye.

THE FORMULA OF MAGNUS.

In our formula for the ocular earning ability $E = F \sqrt[2]{K}$, the visual act being F and $\sqrt[2]{K}$, the ability to compete, we first resolve the act of vision F into its physiologic factors, that are necessary for the estimation of the earning ability; C is the maximal central visual acuity, P the visual field and M the muscular action, we have thus acquired the expression:

$F = C$ (maximum $\sqrt[2]{P^4 \sqrt[2]{M}}$ = the physiologic act of vision; while for the ability to compete;

$$\sqrt[2]{K} = \sqrt[2]{\frac{C_1 + C_2}{2}} V\bar{P}^4 \sqrt[2]{M};$$

thus the complete formula for the ocular earning ability would

be: $E = C$ (maximum) $V\bar{P}^4 \sqrt[2]{M} \sqrt[2]{\frac{C_1 + C_2}{2}} V\bar{P}^4 \sqrt[2]{M}$ which is the formula from which we calculate the economic damage to vision.

At first glance it might seem that this formula has too much of the mathematical stamp, and that its handling would not be easy nor convenient, but this is the numerical expression for the normal visual earning ability, and as that is a composite quantity, its mathematical expression must, of course, be composite. Each of the individual factors entering into the normal visual earning ability may be impaired, and hence have their individual influence upon the calculation. If we would try to simplify these complicated relations more, they could only be forced, and thus an arbitrary speculation substituted for a formula of scientific exactness. But figuring with this formula can be made very convenient, if we allow the expert mathematician to step in to help us out, for by

0.625 0.65 0.675 0.70 0.725 0.75 0.775



his means we have been enabled to not only figure out a series of tables by which at a glance the effect of the various ocular injuries upon the earning ability can be ascertained, but we can, by the use of certain geometric curves which have been arranged for our purpose, exactly figure the several factors for ourselves.

In plate II we delineate each of the factors of our formula in a curve in such a manner that the individual curves give the condition of this factor within its working range. For instance, in plate II line I shows the geometric course of periphtric vision, if the scientific value of P as absciss and the economic value $\sqrt{P}$ are taken as ordinates; line II represents the geometric course of the muscular action, if the scientific value of M as absciss and the economic or actual value $\sqrt[4]{M}$ are taken as ordinates. The three lines, III, IV and V, show in an analogous manner the ability to compete in its different values, using the 5th, 7th or 10th root. By the assistance of these curves we may ascertain, in a given case, the economic value of the impairment of every factor of our formula. We first ascertain the amount of impairment on the absciss representing the scientific valuation, then we trace vertically the corresponding line from this point on the chart, and at the intersecting point where we meet the ordinate on the left of the curve, is the economic value of the damage. By this method, the very inconvenient handling of the root values and separate figuring of the single factors of the formulae may be avoided. Thus, with any great amount of mathematical calculation, we may estimate the economic value of each damage of the different factors shown in the tables. The calculations found by the use of these diagrams vary so slightly from those found by working out the roots; there will be a great saving in time made by the use of these curves, and the tables which we have evolved which will be found in the published German edition of Magnus' work, and in that which is now in press, in which we have both collaborated.

CALCULATION WITH THE FORMULA.

To recapitulate our formula:

$$E = C \sqrt{P} \sqrt[4]{M} \sqrt[2]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt[4]{M}.$$

C being the maximal central visual acuity, P the visual field, and $\sqrt[4]{M}$, the action of the extrinsic muscles and $\sqrt[2]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt[4]{M}$ is the ability to compete. The latter is composed of the arithmetical proportion of the central visual acuity of both eyes $\frac{C_1 + C_2}{2}$ the periphtric

vision $\sqrt{P}$ and the muscular action $\sqrt[4]{M}$, with the provision that we make the root exponent higher or lower, 5, 7 or 10, as the case requires. Let us now figure an example by the aid of this formula:

In a simple case, one eye having suffered a traumatic diminution of the visual acuity, to $\frac{1}{2}$ or 0.50, according to the scientific standard. This injured person follows a trade which has higher visual demands, for instance, is a skilled iron worker; in such a case the maximum C remains unchanged, because this is the higher visual acuity of the sound eye which remains the same. C is therefore = 1. P the visual field, and M the muscular action, remain unchanged. These three factors represent each the value 1. In this case the unknown quantity is the ability to compete,

$$\sqrt[10]{\frac{C_1 + C_2}{2} \sqrt{P} \sqrt[4]{M}}$$

$\frac{C_1 + C_2}{2}$ being the arithmetical proportion of the central visual acuity of both eyes. C, the uninjured eye remains = 1; C the injured eye, should be reduced, according to our supposition, to 0.05 of the scientific standard. Looking now on plate I on the absciss for the scientific value, 0.05, trace this line upwards until we meet the economic curve (II), and go from the point where the vertical line cuts the curve we go to the left and find there on the ordinate the economic value of the scientific estimation for the acuity of vision, as the plate shows, this is about 0.58. By inserting this value in the arithmetical proportion of the acuity for both eyes, into $\frac{C_1 + C_2}{2}$ we have $\frac{1 + 0.58}{2} = 0.79$. This we insert into the

factor $\sqrt[10]{\frac{C_1 + C_2}{2} \sqrt{P} \sqrt[4]{M}}$; we then have $\sqrt[10]{0.79 \sqrt{P} \sqrt[4]{M}}$ in which $\sqrt{P}$ and $\sqrt[4]{M}$ are each = 1; the whole value is then $\sqrt[10]{0.79 \times 1 \times 1}$. As this is only a slight injury, the ability to compete cannot be impaired very much, consequently we make the root exponent = 10. This value $\sqrt[10]{0.79 \times 1 \times 1}$ we can find in plate II. curve V. We look simply in the absciss for the value 0.79, trace the line from there upwards until we meet curve V, going from there to the left, we find on the ordinate the value 0.972. If we insert this value into the formula we would find $E = 1/0.972$, and as E, in our formula, has always been a fraction of 1, it must be multiplied by 100 if it would be represented as a percentage. We have then for $E = 97.20\%$.

We now see that calculating with our formula is really simple. All we need is to insert into the equation the values of the individual factors as we find them on the plates.

When this simple procedure is done, the formula has been reduced to an easy multiplication example. By reading the curves the values found are often a little different from those by full calculation; but as this difference is not great and may be avoided, to a great extent, by a careful reading. Besides this, the values found by reading the diagrams may at any time be regulated by comparing them with the tabulated values compiled in part IV. of our book.

We believe that by construction of the curves, the calculation has been so simplified that in spite of the seemingly complicated composition of our formula, it can be done by even an inexperienced mathematician. Reservation must be made in cases where the injured person had possessed before the time of the accident only one eye or was weak sighted. In such cases special modifications of the calculation have to be made which will be explained in the following:

SPECIAL CONSIDERATION OF VARIOUS OCULAR INJURIES AND VISUAL DEFECTS.

In our book we have gone extensively and specifically into the consideration of the various forms of ocular injuries and effect of diseases upon economic vision. It is impossible in this article on account of the complexity of the subject, and the amount of time necessary for elucidation to do so. I shall, therefore, only give you the results of our calculations.

THE RELATIVE IMPORTANCE OF DISTURBANCES OF THE VISUAL FIELD.

In estimating the defects of the visual field we should remember that $\frac{2}{3}$ of the binocular field belongs to and is controlled by both eyes. Under certain circumstances these disorders have only monocular effects. Such limited disorders are not considered detrimental to the earning ability, because the total visual field does not suffer restriction of its normal limits.

An experienced calculator may easily ascertain the arithmetical values of the different defects of the visual field. In the following table we give their relative valuation:

**THE EARNING ABILITY AND THE IMPAIRMENT THEREOF
IN THE DIFFERENT DISORDERS OF THE FIELD OF
VISION WITH REMAINING NORMAL CEN-
TRAL VISUAL ACUITY.**

1	Partial defects in the field of one eye. Concentric contraction of the field of one eye. Absence of the temporal half Absence of the entire field of one eye.	5/6	90,458	9,542
2	Concentric contraction of both fields reaching to 60°. Absence of the temporal half of both fields.	2/3	80,012	19,988
3	Homonymous hemianopsia dextra vel sinistra superior vel inferior.	1/2	68,302	31,698
4	Serious concentric contraction of both fields reaching to 30°.	1/3	54,650	45,350
5	Total concentric contraction of both fields reaching to 5°.	0	0,000	100,000
6	Absence of the nasal halves of both fields. Absence of the nasal half of one field.	1	100,000	0,000

As in practice disorders of the visual field are usually complicated by injury to the central visual acuity in either eye, the calculation is rendered slightly more complex, but is of a similar nature to the foregoing. Thus, we have evolved the following table for complicated cases:

Auxiliary data for the estimation of the earning ability in disorders of the field of vision where the central acuity of both eyes is impaired differently:

1	Partial defects in one field. Concentric contraction (higher and lower degrees) in only one field. Absence of the temporal half of one field.	5/6	0,90458
2	Small concentric contraction of both fields to 60°.	2/3	0,80012

3	Absence of the temporal half of both fields.	1/2	0,68302
4	Homonymous hemianopsia dextra vel sinistra superior vel inferior.	1/3	0,54650
5	Great concentric limitation of both fields reaching to 30°.	0,00	0,00000
7	{ Absence of the nasal half of both fields. Absence of the nasal halves one field.	1	

As these disorders of the field of vision do not condition an impairment of the earning ability, only the disorder of the acuity of vision would have to be indemnified.

Gives the results of our calculations. Complicated cases are to be dealt with in a similar manner.

WHAT ACTION IS NECESSARY IF THE INJURED PERSON HAS PREVIOUSLY ONLY HAD THE USE OF ONE EYE?

The scientific and economic conception of monocularism is not the same. While, from a scientific standpoint, a person is to be regarded as one-eyed, whose eyeball has been removed, or who is otherwise hopelessly blind, the meaning of one-eyedness or monocularism developed for professional life, has a much wider range. For economic purposes a man must be regarded as possessing only monocular vision who has but one useful eye for the earning of his living, if the other has insufficient vision for this purpose. The condition of the poor eye and the degree of its visual acuity is immaterial in this consideration. If it is not an useful eye, that person may be considered to have but monocular vision for the purpose of earning his living, for he could not follow his trade if he lost the more normal eye, and would be in the same position as a man who had originally one blind eye or none at all. Although there is an optical and scientific difference, the economic consequences would be the same; both would be unable to work. His not being entirely blind, is of inestimable value to him; but this would have nothing to do in judging his ability to earn, he would be professionally incompetent if the uninjured eye is unequal to the demands of the trade. Therefore, for our purpose, we would regard many individuals as possessing but monocular vision who, according to the scientific standard, can see more or less with both eyes. Those who squint and suppress the image of one eye, those who have sufficient refractive error, which can-

not be corrected, or which lowers the acuity of vision to 0.15 or 0.05 (according to the visual requirements of the trade), those that have congenital monocular amblyopia, etc., belong to this class.

In the case of an ocular accident happening to a workman we must not only consider his own peculiar ocular condition, but the side of the insurance company, employer or defendant from whom he may be seeking indemnification for his injury; so we must be sure that the second parties are not burdened with the blame for an impairment which the laborer had before the accident. Thus, out of fairness to the employer, defendant and to the workman himself, we would not arithmetically consider the scientific standard of binocular vision in the case of a workman who has entered into his employment with only one working eye, and who has suffered an injury to it; we calculate his claims in the same manner in which we figure the ability to compete which is equal to the visual act, and the acuities of vision of both eyes in an arithmetical proportion, thus:

$\sqrt[2]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt{M}$ which in the case of a one-eyed person would become: $\sqrt{C} \sqrt{P} \sqrt{M}$

This formula leads to the same results as that which we get for the visual acuity in binocular vision; as by this method, a man who has originally one eye, would be impaired through an accident to the same extent as that which occurs in a binocular case. When an employer hires an individual who is originally in possession of one eye or who has practically only monocular vision, he does this under the supposition that this defect does not hinder him in his work, and regards this condition as the normal for this particular individual. If there is blindness in one eye, without any difference in the cosmetic appearance, we would make an arithmetical difference in the root for the ability to compete as already noted.

In the case of injury to the visual field in an originally one-eyed person, we would consider the following estimates:

Loss of the temporal half there is retained.....2/5

Loss of the nasal half there is retained.....3/5

If the concentric contraction reaches 30° the value remaining is 2/5

If the limitation on the nasal side is more than 45°, on the temporal side 70°, below 65°, above 40°, the value of the remaining field of vision is.....8/15

THE MEANING OF WEAK VISION FROM AN ECONOMIC STANDPOINT.

There are many cases to which trauma occurs in which the eyes had some previous disorder or disease affecting the visual acuity, field of vision or ocular muscles. A recent article by Walther (50) who reported upon the examination of the eyes of 2,672 active workmen; printers, metal workers, wood workers, glass and porcelain workers, woolen workers, electrical and gas workers, found that exclusive of refraction defects that could be corrected by lenses, 611 were more or less amblyopic. Of these 347 (63%) had congenital defects; 224 (36%) acquired defects: 95 being of doubtful origin. In 15% the poor sight had been caused by the work.

Every practitioner knows how common are opacities of the cornea, and other disorders of the ocular media which affect the visual acuity in those classes of people that furnish laborers and artisans. Considering further how many cases of strabismus, high refractive errors, congenital anomalies, etc., which are accompanied by weakness of vision in one or both eyes, we have to admit that many cases of ocular accidents have previously had weak sight, and whose acuity of vision did not reach the economic limit, i. e., 0.75 or 0.50. If the physician, who is called to estimate the amount of visual damage, finds indisputable proof that there was weakness of vision before the accident; this should certainly be included in our estimates. If there is no such data, the person should be regarded as formerly normal. Such conditions certainly make the calculation much more difficult, but by the aid of our formulae these complicated cases are readily solved. We have gone into these conditions very extensively in our book, and at the end of this article will be found a number of examples which have been solved by the aid of our methods.

THE LOSS OF AN EYE THROUGH ACCIDENT.

Claims for damages in the case of accidental loss of an eye are of frequent occurrence.

While the clearness of sight is just as good in monocular vision as in binocular, and from the visual point of view, the one-eyed condition does not offer any obstacles for following a trade, this expression should be understood as only pertaining to the visual acuity and not to the other factors. Thus, if the injured person retain a visual acuity of 0.75 or 0.50 we should not immediately state that his working powers have or have not suffered, but should examine into the visual requirements of his trade; but as a general rule, the resultant

visual acuity may be regarded as economically normal or 1. A one-eyed man has lost 5-6 of the field, therefore, we put this valuation into the formula as 5-6, the action of the muscles would be materially impaired and we have figured that its valuation is ${}^4\sqrt[2]{\frac{1}{3}M}$, therefore, the formula for working vision in the case of monocular blindness would be:

$$S = 1C \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M}.$$

The factor of the ability to compete is decidedly important after the loss of one eye, we would therefore choose for it the exponent 5 for the loss of one eye in those trades having higher visual demands, whereas for coarser trades we would take 7 for the exponent; thus the following expression would result for the ability to compete in finer trades:

$${}^5\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M}$$

$$\text{in coarser trades: } {}^7\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M}.$$

After the first year, the factor of the muscular movements, adaption, etc., need not be so seriously considered and, therefore, after this time we displace the formula for the lessened muscular movement by that of the normal. Our full formula for the earning ability when one eye becomes blind would be the following:

According to the formula for the earning ability:

$$E = F \times \sqrt{K}$$

1. In professions with higher visual demands for the first year after the injury:

$$E = 1C \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M} {}^5\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M}$$

and after the first year:

$$E = 1C \sqrt[5]{\frac{1}{6}P} {}^4\sqrt{M} {}^5\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt{M}$$

2. In professions with lesser visual demands for the first year after the injury:

$$E = 1C \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M} {}^7\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt[2]{\frac{1}{3}M}$$

and after the first year:

$$E = 1C \sqrt[5]{\frac{1}{6}P} {}^4\sqrt{M} {}^7\sqrt[1]{\frac{C+O}{2}} \sqrt[5]{\frac{1}{6}P} {}^4\sqrt{M}.$$

According to our calculations for trades with higher visual demands we find that a one-eyed person, after being cured of the ocular disease, has an impairment of the earning ability amounting to 30,903% for trades requiring higher degrees of vision for the first year after the accident, and after one year of 21,966%, while for vocations demanding less vision the values would be 27,315% and 18,388%. Of course, it

would be left to the management of the insurance companies as well as to the physician to change these proportions more or less according to the circumstances of the case.

Approximately we may say that a one-eyed person has lost 30% of his earning ability for the first year after the accident, and 20% afterwards for the higher class of trades, and for the lower class the proportion would be 27% for the first year and 18% thereafter.

Certainly there is a difference between the individual who has been employed in fine handiwork and one doing common manual labor, and justice demands that a difference should be made in judging the indemnity. The system hitherto in vogue in Germany was an unfair one, as it over-estimated the valuation for the loss of one eye; the Imperial Insurance Office, having first given 50% and later 33 $\frac{1}{3}$ % indemnity. Heddäus had fixed the indemnity at 50%; Groenouw accepts the sliding scale as made by Magnus, his values fluctuating between 20% and 30%, and are therefore very close to the indemnity proposed by Magnus; but all of these must be regarded solely as arbitrary estimations, and not the result of exact calculations as have been given in this essay and in our book. Examination of one-eyed persons in the iron and steel trades in certain districts in Germany showed that there was an actual impairment in the amount of work done and the wages earned of 26% at the highest. (29) Examination of the Miners Association in Halle a. S. (44) showed only 20%. The examples met with in actual practice agree with the figures of Magnus.

Our valuations admit after one year of a reduction, because those muscular functions which were formerly executed by both eyes are partly or entirely restored. The figures of 21.97%, or 18.39%, should be regarded as a maximal limit to which the damage may be reduced. Sudden total loss of one eye is of more economic damage to the individual than where the sight gradually goes. *We have figured that the impairment of the earning ability from the gradual loss of sight in one eye following an accident in trades requiring higher visual demands is 21.97%; in professions with lower visual demands 18.39%.* Our figures are much lower than those given by previous impractical methods, for there was a time when 50 per cent was regarded as a valuation of the loss of one eye and even now the German Insurance Office gives a rating of 33 $\frac{1}{3}$.

THE SUPPOSED GREATER DANGER OF A ONE-EYED PERSON BECOMING TOTALLY BLIND AND ITS RELATIONS TO INDEMNITY, AND OTHER INJURIES.

We do not consider that this danger is to be figured in the allowing of additional indemnification in relation to accidents. In the first place experience shows that but few one-eyed persons ever lose their other eye through an injury; the danger of sympathetic inflammation can readily be settled by an operation, for early enucleation removes it; if sympathetic ophthalmitis has already set in, it, of course, produces total disability.

Accidental injury to the crystalline lens, aphakia, of course produces blindness, which, if monocular, should be handled as we have the case of a one-eyed person, but an eye which has a cataract and which is otherwise normal, forms, as Fuchs says, a reserve for the future. Aphakia in one eye, from the great difference in refraction generally produces economic monocular sight, but we may consider these conditions by the same method as that which we have previously given, entering their proportional valuation by the exponent of the root in estimating the ability to compete. Injuries of the eyelids, conjunctiva and cornea certainly have their influence. There are many diseases of the eyes and errors of refraction that impair the working power. It is impossible in this essay to consider them otherwise than to state that their effect upon the economic valuation of vision is to be deduced from the results that have happened to the visual acuity, visual field and ocular muscles in a similar manner to that which we have used in the previous portion of this article.

ESTIMATION OF THE PECUNIARY LOSS TO THE INDIVIDUAL BY REASON OF VISUAL IMPERFECTIONS.

In the foregoing we have estimated the economic damage in the form of percentages. Now it remains to apply these ratings to the conditions met with in daily life.

Money being the world's medium of exchange and of valuing a man's work or time we must reduce the economic damage in each individual case to its value in dollars and cents or the monetary medium of the country in which the compensation for damage may be sought. It goes without saying that the value of men's time and wages differ greatly, not only in different trades and professions, but even the various members of the same trade receive varying wages.

If we wish to exactly estimate the damage to the individual case, we

must, therefore, figure with the compensation that the individual himself has been getting and his probable future earnings. It must be allowed that this may be done and that this estimate may be legitimately used as a basis with which to calculate the pecuniary loss he may sustain by reason of lessened working and earning ability. In the case of artisans and the working classes generally, it might be considered strict justice to the defendant to take the average earnings of the class to which the plaintiff may belong as a basis upon which to figure the indemnity.

It should be likewise considered that an old man cannot lose (as regards earning ability) as much as a younger man, for the elder has fewer prospective years of employment and consequent less money equivalent than the younger. *Thus the age of the plaintiff should always be considered.* It may likewise be taken for granted that earning life begins at 15 and ceases at 65 years; that in the case of a business or professional man the wages will be doubled every 10th year until cessation of working life; that in the case of working men this doubling will occur for the first two periods of five years and afterwards the usual rate will be maintained until at the age of 50, and 15 years thereafter though competition of younger men and natural infirmities of this period of life then will be a certain reduction in the wages. Exceptions to this estimate must be made in the case of girls and women, since their working years are fewer and their increase of earnings does not follow the same rule as that of men; many, perhaps the majority, being employed in shops, mills and offices and in such positions that increase of skill and experience are not rewarded by increase of their income.

Hansell assumes (17) that a professional or business man will double his earnings every ten years, provided his mental and physical health is preserved, and that he has average intelligence, industry and ambition. He considers that when the earning power of the individual falls below 66% of the average earning capacity, that promotion with increase of income cannot be reckoned and that when 80% of the visual power is lost the man is no longer in a position to earn the income that was his before, and, therefore, not only receives no increase, but his wages thereafter may diminish; and if vision be reduced to counting fingers at 1-3 m. (Magnus 0.15 to 0.05) the loss is 100%, the individual earning nothing and also becoming a charge upon his family or the community. The doubling of the earnings for each may be applied as a principle to most business and professional men, but in the case of laborers and artisans, who receive no promotion

after having attained a certain grade, it must be modified in respect to the doubling of wages or income every tenth year. This permits of a decided simplification of the computation, for as Hansell says: (17) if a man earns \$20.00 a week, and will continue to earn that amount during the remainder of his working years, his loss will depend upon the age at which the incapacity begins and its degree.

In cases where the blame of the accident may be laid upon the second party or where, through previous business agreement, an employer or insurance company has arranged to pay a fixed sum or a pension in case of accidental injury, the amount of the indemnity should be in accordance to a definite schedule based upon the average wages earned in the vocation to which the individual may belong. It should be remembered that partial loss of vision not exceeding 25% in vocations having higher visual demands and not exceeding 50% in those with lower demands does not injure the earning ability to any degree. Indemnity, for actual disability therefore, should be granted only to those whose eyes are damaged beyond reparation to a greater extent than above named.

It is only in vocations that have visual requirements that a close estimate of these visual values may be made. In those classes of business life whose followers are not engaged in manual labor, whose business capacity relies more upon brains than upon actual handiwork, our rules cannot always apply, for even a blind man could work with monetary advantage in some trades and business; but for the laborer, for the artisan and for those professions in which the visual perceptive faculties are necessary, our rules and tables may be deemed fitting. By adjusting the age scale for the pecuniary earnings, to the percentage of the actual damage as figured by the method of Magnus, we may arrive at an exact mathematical estimation of the economic damage to the individual for the loss of vision in any given case.

We have figured a series of tables by which the earning powers in dollars and cents for any period of life may be readily figured. For these details we must again refer to our book.

While by this method of reasoning we are enabled to exactly estimate the amount of money that a given case may reasonably expect to earn provided he remain in the same business and exercise ordinary skill and diligence and hence accomplish an average amount of work, it must be admitted that such figures are hypothetical. However, such immense interests as those of the modern insurance companies and

many other sociologic standards are successfully based upon the same principles and we must here be allowed to use them. The result to be achieved by all our computations is not the exact amount that a man may earn, but that which he may reasonably expect to receive for his labors.

We will now take up some specific examples to illustrate the application of our methods for determining the amount of economic damage to the individual from ocular injuries.

Example 1. For our first example we take a case that often comes up in the courts of law. An artisan whose business has higher visual demands, who has previously had normal vision, receives an injury to one eye while working at his trade, by which the sight of the injured eye is wholly lost, the vision in the other remaining normal. The question then arises, what economic damage has this man sustained?

We have shown that in the higher class of trades, during the first year following the accident, a one-eyed person has lost 30 per cent of his earning ability and afterwards the loss may be reckoned as 20%. As a matter of convenience we will suppose that this man is injured at the 30th year of age, and that he has been earning for the previous five years \$1000.00 a year, with the expectation of earning this sum annually until he is 50 years of age, when for the next 15 years his average earnings, on account of disability due to age and the competition of younger workmen, will fall to \$750.00 a year and his working life is to cease at sixty-five years. His total earnings for the balance of his life would then be reckoned as follows: 20 years at \$1000.00 a year; 15 years at \$750.00 a year; total \$21,000.00. For the first year after the accident instead of earning \$1000.00 he may expect a loss of 30% (\$300.00) and for the following 19 years instead of \$19,000.00 he would lose 20% (\$3,800.00) and the following 15 years instead of \$11,000.00 he would lose 20% (\$2,200.00), making a total loss for the 35 years of working life of \$6300.00, which is his personal economic damage, an amount which he might reasonably expect to receive as an indemnity for the loss of earning ability due to the accident. This sum should be used as the scientific basis for settlement of contested cases; modified according to American law by a reduction being made in favor of the defendant in case of extenuating circumstances or contributory negligence and an addition made thereto for actual expenses incurred by the plaintiff during his illness and damages for the pain and anguish suffered by reason thereof. These amounts must always be empirically estimated by the courts.*

*Seven thousand dollars has been recently awarded in Texas for the loss of an eye. See page 348 these ANNALS.

Example 2. If this man were injured at the age of 40 the same method of calculation would give him a prospective compensation of \$21,000.00 for the balance of his earning life, instead of which, for the first year he would receive \$700.00, for 9 years more, \$6300.00, and for the 15 years following \$11,000.00; making a total economic value of \$16,700.00, a resulting economic damage of \$4,300.00.

Example 3. If the same case were injured at the age of 50, we would suppose, that his work for the balance of his life would be less valuable and that he would be earning for the next 15 years \$750.00 a year, total \$11,000.00; for the first year following the accident he would be earning 30% less, \$525.00, and for the following 14 years 20% less, \$84,000.00; making a total economic value of \$8925.00, and an economic damage of \$2075.00.

By the use of different rates of compensation and different years other examples could be readily given. The same method of reasoning applied to the loss of one eye in case of an artist or other professional man would yield proportional results. The only difference in the calculations would be the fact that such professions usually become more remunerative as the person grows older. In the case of the common laborer, the only differences would be the lower rate of compensation and the figuring of his economic loss at 20% for the first year after the accident and 18% thereafter.

We will now go on to the calculations involved in more complex cases where the same principles are to be used as those which have been invoked for simple cases:

Example 4. We will take the case of an architect or draughtsman, in his 46th year of life, earning \$2000.00 a year, whose visual acuity in one eye is reduced by an accident to 0.50, the other remaining normal. His profession demands good vision and he is in a measure handicapped for some of his work, especially that of fine draughting. We will proceed to work out this case from the beginning and will, therefore, recapitulate our formula:

$$E = C \sqrt{P} \sqrt[4]{V_M} \sqrt[2]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt[4]{V_M}.$$

In this case the maximum C remains unchanged, because this is the higher visual acuity of the sound eye = $1 \cdot \sqrt{P}$ the visual field, and $\sqrt[4]{V_M}$ the muscular action remain unchanged; the three factors each representing the value I. In this case the unknown quantity is the ability to compete,

$$\sqrt[2]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt[4]{V_M}.$$

$\frac{C_1 + C_2}{2}$ being the arithmetical proportion of the central

visual acuity of both eyes. C_1 , the uninjured eye remains = 1; C_2 , the injured eye should be reduced to 0.50 of the scientific value 0.5, of the scientific standard. Looking now on plate I on the absciss for the scientific value 0.5, trace this line upwards until we meet the economic curve II which is for vocations having higher visual demands, and from the point where the line cuts the curve we go to the left and find there on the ordinate the economic value of the scientific estimation for the acuity of vision. This is 0.58; inserting this value into the arithmetical proportion of the acuity for both eyes, into $\frac{C_1 + C_2}{2}$ we have $\frac{1 + 0.58}{2} = 0.79$. This we

insert into the factor $^x \sqrt{\frac{C_1 + C_2}{2} \sqrt{P} ^4 \sqrt{M}}$, we then have $^x \sqrt{0.79 \sqrt{P} ^4 \sqrt{M}}$ in which $\sqrt{P}$ and $^4 \sqrt{M}$ are each = 1; the whole value is then $^x \sqrt{0.79 \times 1 \times 1}$. As this is a slight injury, the ability to compete is only partly impaired so we make the root exponent $x = 10$. This value $^{10} \sqrt{4.79}$ we can find in plate II curve V, where we look on the absciss for the value 0.79, trace the line from there upwards until we meet the curve V, going from there to the left on the ordinate we find the value 0.972. If we insert this value into the formula we would find $E = 1 \times 1 \times 1 \times 0.972$, which multiplied by 100 gives the earning ability $E = 97$, 20%. This man being injured at this 46th year, he would expect to have earned \$60,000 during the next 20 years. His earning ability being reduced to 97, 20% he would probably earn \$58,320.00, which subtracted from the reasonable expectations of his business, would leave the sum of \$1,680.00, an amount which he might expect as the highest indemnity for the loss of earning ability due to the accident.

Example 5. In the case of a printer who was originally weak-sighted; the vision of one eye $n^1 = 0.65$ and the other $n^2 = 0.55$ (scientific standard); eye 1 being uninjured ($c_1 = 0.65$) while the visual acuity of the other has been impaired by injury to $c_2 = 0.20$. He is in his 26th year and has been earning \$1,000.00 annually and would reasonably expect to earn this sum for the next 25 years, after which his earnings through disabilities of his age, slowness and consequent inability to compete would probably depreciate to \$750.00 a year, making the balance of the money that he might reasonably expect to earn in the course of his life \$36,250.00. Figuring out the earning ability according to our modified formula:

$$c_1 = n \frac{c_1}{n_1} = 0.75 \frac{0.65}{0.65} = 0.75,$$

$$c_2 = n \frac{c_2}{n_2} = 0.75 \frac{0.55}{0.55} = 0.27,$$

the maximum $c_1=c_1=0,75$ while we get for the maximum of the real acuities $c \max=c_1=0,65$. The first value should be replaced professionally by 1 according to the table; the second by 0,83.

To c_1 and c_2 furnishes us the quantity $E^1 = 77,079$, the earning ability is therefore:

$$E = \frac{C' \times E'}{c} = \frac{1 \times 77,079}{0,8333} = 92,495,$$

or a permanent disability of 7,505%. The amount, that before the accident he might reasonably have expected to earn during the balance of his life is \$36,250.00, 7,505% of which would give \$2,720.50, which should be the highest amount allowed as indemnity for the permanent loss of earning ability due to the accident subject to reduction for cause and to increase as determined in Example I.

Example 6. In the case of a laborer who was originally blind in one eye, the other being weak-sighted ($n=0,45$), who at the age of 40 years suffered an injury to the seeing eye, and there remains only a visual acuity of $c_2=0,25$, because $c_1=0$ has to be used, there is $c \max=c_2=0,25$ (professionally = 0,444 ...) and the modified acuity of vision $c_1=0$, the maximum of both values will be:

$$c'_2 = n \frac{c_2}{n_2} = 0,50 \frac{0,25}{0,45} = 0,28$$

which corresponds professionally with the figures:

$$\frac{100 + 0,28 - 5}{45} = 0,511$$

To c_1 and c_1 belong, according to Plate II, or by calculating the root $E_1=39,582$; the earning ability is therefore:

$$E = \frac{c \max E'}{c \max} = \frac{0,511 \dots 39,582}{0,444} = 45,519$$

the loss of the earning ability being 54,481%. At the age of 40 years he would be earning \$800.00 per year and might reasonably expect to earn this amount for 10 years, after which, owing to physical infirmities and increasing age, his earning powers would probably be less, being reduced to \$600.00 per annum; he would, therefore, expect to earn, if he had remained in good physical health, the sum of \$17,000.00; after the accident his earning powers being reduced to 45,519%, he would be justly entitled to an indemnity in proportion, which would be 54,481% of \$17,000.00=\$9261.77, which would be likewise subject to increase or decrease according to conditions of the accident as established by law.

Example 7. A travelling salesman 45 years of age, who recently consulted me had bi-temporal hemianopsia with a

remaining central acuity of 0,20 in both eyes. He stated that he had this condition for a number of years and was enabled to do all his work satisfactorily until recently when the visual acuity had failed, from what he previously thought was normal, to 0,20. He was now able to get about and sell some goods, but largely from memory, as he could not read his business catalogues and letters, and was about to give up his business entirely. His income depended upon sales made and was about \$2000.00 a year. Thus for the balance of his working life his expectations would be for 20 years at \$2,000.00 a year, amounting to \$40,000.00. According to his experience he was able to do all his work until the visual acuity failed and we have shown in table C page 240 that temporal hemianopsia does not necessarily incur earning disability. Therefore, we would figure his economic damage from the amount of the reduction of the visual acuity; the scientific standard, 0,20, would have an economic equivalent of 0,38. Reasoning from this economic loss of acuity and inserting same and working out the formula, we find that the value of his economic powers is about 30%, which has a pecuniary valuation of \$600.00 per annum, which agrees fairly well with his lessened expectations of earning if his vision should remain as it is, but if it further deteriorates he will be totally incapacitated.

Example 8. In the case of an iron moulder 40 years of age receiving a blow upon his head which laid him up from work for a year and caused permanent homonymous hemianopsia. From the effects of the accident, he being laid up for a year, afterwards being obliged to take a lower position in the same line of work, which paid him about one-third less, we would figure his theoretic loss by means of table C as 19.9%, which agrees near enough with the actual conditions of his work, for he was previously earning \$4.00 a day and afterwards was enabled to earn but \$2.75 a day; the total economic damage can be readily figured in this case as in the foregoing.

Examples of such character might be multiplied and cases cited of the most simple form to that of the most complicated character. The foregoing are surely sufficient demonstration of the fact that the percentage of economic loss and its pecuniary equivalent in any given case of ocular injury, may be readily ascertained. The diagrams and tables offer an easy method for this mathematical calculation. Competent practitioners of law or medicine or insurance officials may by these methods determine with exactness, in a manner fair and just to all parties, the amount of damage to the

earning ability of their clients which may have occurred as a result of accidental injuries to the eyes, and this should be considered the principal factor in the settlement of legal claims.

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**ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.**

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(QUARTER ENDING MARCH 31, 1901.)

A New Method in the Dissection of Soft Cataracts.

Dunn, Percy, London, (The Lancet, Dec. 29, 1900.)

The writer considers the present method of treating soft cataracts by dissection and gradual absorption unsatisfactory on account of its slowness, and on account of the risk of causing increased tension if the swelling of the lens proceeds too rapidly. As a safe-guard against this complication he suggests letting out the aqueous humor at the time of the operation, under which circumstances, he claims it is impossible to conceive how glaucomatous symptoms can arise. He bases this assumption upon the fact that the intraocular tension of a healthy eye is regulated by its requirements; in other words, the lower the tension the greater is the secretion of aqueous, the higher the tension the less the secretion. Assuming these premises to be correct, he claims three advantages of this method of procedure: (1) the avoidance of the risk of causing increased tension; (2) the possibility of freely breaking up the lens; (3) the rapid absorption of the soft lens matter.

One case, which the writer operated upon in the manner suggested, healed without reaction, and after fourteen days only a small remnant of the lens could be seen: "The case was that of a child whose right lens I had needled some months previously for congenital cataract. Only one needling was necessary, but at least three months elapsed before the pupil was black. The operation upon the left lens was considerably delayed owing to the supervention of an attack of scarlet fever. When, however, the child had made a good recovery from this, I proceeded to operate upon the second eye as follows: Chloroform having been administered, I took a broad, instead of a fine, cataract needle, and the pupil being well under atropine, I passed the former into the anterior chamber and the lens, making a vertical and horizontal incision in the capsule. I then freely broke up the lens and afterwards withdrew the needle until the point only remained in the anterior chamber.

Next, I partly turned the needle on its axis, by which I allowed all the aqueous to escape slowly from the eye. The globe and conjunctival sac were thoroughly doused with chinosol (1 in 4,000); some drops of atropine of the strength of two grains to the ounce of water were instilled, and a pad of chinosol gauze and a bandage were applied. The result of the operation was as follows: There was no reaction; in four days' time the pupil was quite black and all that was left of the lens was a small quantity of soft lens matter lying at the bottom of the anterior chamber. After the lapse of 14 days there was merely a trace of this lental remnant to be seen.

Report of the Different Operative Method in the Treatment of Trachoma, With Notes Upon the Construction of an Instrument Devised for the purpose.

Jameson P. Chalmers, Brooklyn. (Ophthalmic Record, Feb., 1901.)

The writer has felt the need in his practice for an instrument constructed upon a more accurate basis than the tooth-brush in common use for the operation of grattage, and one which, while accomplishing similar results, could be graded more accurately when applied to the surface operated upon—an instrument which would not necessitate the use of a general anesthetic and could be used repeatedly at successive sittings without undue reaction and without damage to the deeper and normal tissues; also one which would rupture the trachomatous granules and extrude their contents; in doing

this, he believes expression sometimes fails because the trachomatous bodies are too small or their fibrous encapsulation too dense.

He has devised an instrument with which he aims to attack and disperse successive arrivals of granulations upon the surface, by repeating a superficial "grattage" at frequent intervals, thus finally eliminating all granular growth, no matter whether it be superficially or deeply situated. The instrument and method of employment are as follows. The instrument consists of a plain surface $\frac{1}{8} \times \frac{1}{4}$ inch, curved convexly upon its operating surface; upon this are engrafted numerous rows of small pyramidal projections, the four sides of each pyramid slanting towards its apex at varying angles. These edges, together with the sharp edges of the pyramids, constitute the active operating part of the instrument. The mode of use is as follows: "The instrument is placed with its operating surface against the trachomatous or granular surface; slight pressure being made, the apices of the pyramids find their way and insinuate themselves between the bodies of the granules, and they (the granules) occupy these depressions. This results in immediate fixation of the instrument. Forward, backward or lateral movement at once brings the trachomatous bodies in forcible contact with one of the four cutting edges resulting in first rupture, and then extrusion of their contents. Perhaps the most striking feature is its selectiveness for the fibro-granular elevations just mentioned, and contrarily the immunity that a normal mucous membrane possesses from injury by its use. The same amount of pressure necessary for it to engage and rupture trachomatous granules will, if applied to a normal lid lining, result in its gliding over with no injury to the part."

The writer recapitulates the advantages of this instrument in the following words: "1. Its selectiveness or predelection for the granular elevated bodies and the manner in which it at once engages, ruptures and extrudes their contents. 2. Contrarily, the faculty it possesses under pressure of gliding over a normal mucous surface leaving it intact. 3. Its superficial field of action and the little likelihood of cicatrization from operation, the granule only being attacked. 4. The rapidity and ease with which an entire lid surface can be subjected to operation. 5. The facility with which it can be used, a general anæsthetic not being required, as the pain is little under cocaine. 6. The frequency with which the operation can be performed on successive crops of granules, daily, if necessary, the reaction being nil in operable cases."

**An Operation for the Relief of Stoppage of the Tear Passage
Abscess of the Sac, Etc.**

Pond, Erasmus A., Bangor, Me. (Medical Record, Feb. 2, 1901.)

Having found probing unsatisfactory both to the patient and himself, the writer has devised an operation, the object of which is to establish an opening into the nose and to give in this way free drainage of the lacrimal sac, thus relieving epiphora and obviating any danger of an abscess, in one operation.

"The operation is very simple. A long silver probe, with one end blunt and the other with an eyelet large enough to carry a coarse silk string, is threaded and passed through the canal into the nose, where the end is seized with a pair of forceps and drawn out through the nostril. The probe is then unthreaded and the string left in position with the ends tied together. The string is worn about one week, being drawn through the nose two or three times a day." In tying, Pond makes quite a knot which, when pulled through the canal, makes a good large opening. He has used this operation for the past four years with good results. The canaliculus may be slit or not as deemed advisable. Most of the operations have been done under cocain, but in some he has used ether. There is no pain after the first operation and the string can be drawn without causing any hurt. In abscess of the sac the string gives good drainage and saves the necessity of an opening on the cheek. He gives the histories of three severe cases of long duration which were entirely relieved and remained so after a period of two years, and says there are many other cases equally successful.

**Removal of the Right Upper Cervical Sympathetic Ganglion
for the Relief of Glaucoma Simplex.**

Coover, D. H., Denver, Colo. (Phila. Med. Jour., March 16, 1901.)

The writer gives the history of a case of simple glaucoma in which Jomescio's operation was performed. The immediate results of the operation were very encouraging and were as follows: "1. That tension was lowered to almost normal. 2. Contraction of the pupil and slight reaction. 3. Increase of the visual field and visual acuteness, and the temporal field or nasal side of the retina improved, while the nasal field or temporal side of the retina did not improve. These conditions remained until the attack of supposed "cold in the eye," (three months after), which proved to be nothing more than the return of the former disease, glaucoma;" at this time tension was +3, vision reduced to light perception

and the field of vision contracted to where it was at the date of operation, pupil dilated and fixed, no congestion or pain. The writer concludes from this case, that the operation is of no service where vision has been reduced to zero, but may be of service in arresting the disease in the earlier stages and retain vision before atrophic changes have taken place.

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Epicanthus.

Foggin, George, Newcastle. (Ophthalmic Review, Jan., 1901.)

The writer divides congenital epicanthus into (a) transient or temporary, and (b) persistent or permanent. The former disappears as the nasal bones of the child develop, and is apt to be lost before the eighth year. The latter remains persistent because the vomer and nasal bones do not develop sufficiently, leaving a flat bridge of the nose over which the skin is tightly drawn. This tightness of the skin by its pressure on the bones, aids in checking their satisfactory development. The writer also makes the suggestion that excessive tightness of the tissues of the cheek may be a cause of epicanthus, for this may be experimentally produced by pressing the fingers in a downward and outward direction on the facial aspect of the superior maxilla.

In the palliative treatment of an epicanthus that is or threatens to become permanent, the writer makes use of a spectacle pince-nez, the spring of which pinches up the bridge of the nose, thus neutralizing the tightness of the cheek muscles and taking off from the bridge of the nose a pressure which retards its expansion.

When orthopaedic treatment fails to accomplish the desired result, an operation may be desirable. A method of procedure which the writer used with success is described. He passed several sutures transversely across the bridge and tied them tightly to hairpins, one on each side, thus pinching up a fold of skin upon the bridge of the flat nose. The effect looked neat, and to maintain it he passed a Graefe's cataract knife subcutaneously on each side of the nose, and detached the tissues as freely as possible from the bridge of the nose and somewhat beyond the extent of the pinched-up fold on either side. He then passed four sutures through a flat piece of lead, shaped to each side of the nose, about an inch and a quarter long, tapering from five-eighths to half an inch in width. These were kept in situ for a fortnight, the pain and swelling being somewhat severe for four days, then gradually subsiding. The result was gratifying; the epicanthus had disappeared, apparently permanently; and in place of the flat

bridge there was a more natural contour of the nose, without the central unsightly scar of the usual operation. The writer's experience with this subcutaneous method is limited to two cases; hence he merely wishes to suggest it for future trial and experiment.

Value of Radiant Heat in Eye Diseases.

Doyne, R. W., Oxford. (Trans. Ophth. Soc. of the United Kingdom, 1900.)

"There is, of course, nothing new in the use of radiant heat to the eye, and I dare say there may be nothing new in the procedure I have adopted for some time now in a certain class of eye troubles, that of utilizing for this purpose an ordinary electric incandescent lamp. The somewhat analogous use of these lamps, enclosed in a kind of oven, has been in vogue for some time now in the treatment of joints.

The drawbacks to the application of hot fomentations have long been recognized, producing as they sometimes do a "soppy" condition of the conjunctiva and loss of tone in the skin, with consequent entropion, especially in elderly people; both of which conditions too frequently aggravate the mischief that the fomentations are intended to relieve.

The value of radiant heat in the shape of Turkish baths has for some time now been advocated in the treatment of cyclitis, and this is the condition for which especially I claim relief by the method I suggest, for it produces the effect locally of a Turkish bath in a concentrated form.

The great difficulty in relieving patients suffering from chronic cyclitis is too well known, and when it is occurring in patients over forty, I am inclined to look on such cases in the great majority of instances as practically hopeless.

Assuming that the trouble lies in ciliary glands, described by Collins, the difficulty of the situation has prevented local treatment doing much good, while constitutional treatment does not seem to help much. Now with the application of radiant heat in the manner I describe, the anterior pole of the eye gets well roasted, and doubtless the effect of such roasting on the ciliary glands would be to set up increased metabolism, and as we have reason to suppose from analogous conditions this would tend to set up a healthy reaction; and this I believe to be the case.

I do not mean for a moment to suggest that all cases of chronic cyclitis that have been going on for years will at once get quite well. Such cases have been disappointing in the past, and I fear will continue to be so in the future; but I do say that at any rate in some cases a very marked amelio-

ration has taken place in a short time, and some even have appeared to get well.

I will not try your patience by quoting cases, the time has hardly come for that, and to speak of a case as being definitely cured after going on for years requires a longer period of observation than I have as yet had opportunities of making.

In cases of acute iritis the frequent application of radiant heat in this way has at least been grateful to the patient in relieving pain, and has seemed to me superior to hot fomentations or the application of dry heated wool.

In chronic iritis my experience has not been so encouraging, or to put it more definitely, it has not appeared to do as much good as in cases of cyclitis.

In neuralgic conditions of the eye, especially in neurotic patients, it is of great use, but perhaps not more than anything else that produces a strong mental impression.

Anyhow there are a troublesome class of patients who are always looking out for some new thing, and my confrères may be glad of hearing of something fresh to suggest to them.

I generally use a sixteen-candle frosted glass lamp. The patient sits by its side keeping the eye as close as can be tolerated with the lids closed. In cases of chronic cyclitis or chronic iritis, I apply it at first for five minutes, increasing to twenty minutes three times a week or even daily. In cases of acute iritis, much more frequently, but not longer than for ten minutes at most. At first I used brown paper between the eye and the lamp, but now, except in cases of acute iritis, when I keep a pad of cotton wool on the eye, I use it without any intermediary. Of course the whole side of the face gets intensely hot, and it may produce a little giddiness, but except for this I have never found any inconvenience; I direct the patient to sit still in the dark or subdued light for twenty minutes after the application, and I have found the value of the treatment increased by gentle massage and cold douching after the heat has been withdrawn."

A Clinical Study of One Hundred and Fifty Cases of Hyperphoria.

Reber, Wendell, Philadelphia. (Jour. Amer. Med. Ass'n., Jan. 19, 1901.)

Reber has submitted his last 700 cases throughout which there has been almost absolute uniformity of study, to a careful review in order to find out what percentage of cases of hyperphoria had been noted, and also what lessons were to

be derived from a study of these cases. In every case painstaking correction of all refractive errors was made, the tests for hyperphoria preceding and following the refraction. He found among these 700 records, 525 refraction cases and, acting upon the conviction that proper lenses cannot be intelligently prescribed without a full knowledge of the muscular states, submitted each of these to an examination with the Maddox rod. He prefers the latter to any other test of muscle balance and gives his reasons for this preference. He believes a hyperphoria of less than five degrees may be entirely left out of account; and even in higher degrees he has been governed mainly by the symptoms, in determining whether vertical prisms should be prescribed or not.

The writer was impressed by the fact that in 49 out of 150 instances in which hyperphoria was found, it was wholly or partially latent. To bring out this latent hyperphoria he used a slight modification of Posey's method. After the refraction of the right eye was corrected, he placed in front of the correction a Maddox rod. When the left eye was corrected he immediately directed the patient's attention to the streak of light and after carrying the streak several times from the vertical to the horizontal position, had him tell its relation to the point of light. By this latter manoeuvre he takes the higher centers off their guard and temporarily sets aside the dominating influence of the cortical centers over the eye-muscles, thus revealing the imbalance.

The writer considers that age plays an important part in hyperphoria, for he found it much more commonly manifest after fifty than before that period; he is, therefore, strongly inclined to attribute the loss of compensation in the external ocular muscles, to the loss of ciliary elasticity.

He gives statistics showing the proportion of the 150 cases belonging to each decade, the refraction conditions with which the hyperphoria was associated, the frequency of each degree of hyperphoria, and the number of times he found it necessary to prescribe a vertical prism. The latter amounted to 96, in which the result was good 78 times, improved 6, no change 6, unknown 6. In the 54 cases in which no prism correction was ordered the result was fairly good. Of the 96 vertical prisms prescribed, full corrections were ordered in 20 cases, three-quarter corrections in 60 cases, and half the deviation was corrected in 16 cases. Full corrections were made only in glasses for near work, for the author's experience has taught him that for the working distance full correction is better borne than for infinity.

Tenotomy was resorted to in only five cases, each of which

presented a hyperphoria of at least three degrees, and all of which were benefited by the operation.

The rational treatment of hyperphoria would, in the writer's words, resolve itself into "(a) wearing a proper correction for six months; (b) exclusion of causative diathesis or central nervous disease; (c) convergence-training, if convergence be weak; (d) convergence-repression, if convergence be excessive; (e) if the hyperphoria is still annoying, prism correction of one-half to two-thirds of the vertical deviation for distance, and two-thirds to all of the deviations for near work; (f) if the hyperphoria continues to produce urgent symptoms in spite of the preceding measures, tenotomy of the overacting elevators of one eye or the depression of the other eye finally becomes justifiable."

The writer's study of his 150 cases of hyperphoria has led him to record the following convictions:

1. Hyperphoria occurs in about 1 out of 6 patients who seek counsel of the ophthalmologist.

2. It is present to the extent of .5 degrees in 1 out of 3 refraction cases.

3. It becomes worthy of special attention in about 1 out of 5 refraction cases.

4. It is more likely to be latent before the 30th year—33 per cent of all cases—and manifest after that time.

5. It occurs most frequently to the extent of about 1 degree.

6. The most frequent symptoms are supraorbital, temporal, and occipital neuralgias, photophobia, drowsiness, and abnormal physical tire after prolonged near work.

7. A full quota of sleep, daily open-air exercise, and a well-regulated life are all highly important factors in trying to make hyperphorics comfortable.

8. Hyperphoria is found a little oftener associated with esophoria—57 per cent—than with exophoria—37 per cent. This is probably because compound hyperopic astigmatism with its associated convergence-excess outnumbers all other anomalies of refraction.

9. Convergence-training—if convergence be insufficient, and convergence repression—if convergence be excessive, frequently relieve hyperphoric symptoms entirely.

10. The vertical prism has a field of pronounced usefulness.

11. Prism corrections will be of service in about 50 per cent of all cases. One-half to two-thirds of the hyperphoria may be corrected for infinity, and two-thirds of the full amount for work at the occupation distance.

12. When all these means have been exhausted, section of some one of the vertical muscles may be thought of. About one out of 20 hyperphorics whose deviation is 2 degrees or more will profit more by tenotomy than by any other treatment. Two or three degrees is likely to be the amount permanently obtained by vertical tenotomy.

13. The only fruit that can be borne of the attempt at hospital or dispensary treatment of hyperphoria—or for that matter any but the simplest muscular anomalies—is vanity and vexation of spirit."

The Normal Declinations of the Retinal Meridians.

Stevens, George T., New York. (N. Y. Med. Jour., Feb. 16, 1901.)

The writer gives an exposition of this topic which is, to some extent, a repetition of matters which he has previously published, but which embraces a new statement of a subject which he believes has been rapidly developed on important lines, and which he considers of vital importance, not only in local ophthalmology, but in general affections of the body. He defines "normal declination of the retinal meridians" as "a deviation of the vertical, horizontal, or any given meridian of the eye from the corresponding meridian of external space, when the line of regard of the eye is directed parallel to the median plane and in the horizontal plane, the head being exactly erect or, more technically, in the primary position." If the top of the meridian line leans towards the temple, it is termed a positive (+) declination, while if the line leans towards the nose, it represents a negative (—) declination.

"There are normal declinations and declinations from disease or injury. It is therefore necessary to know what a normal declination is not. It is not the tilting of the meridians which results from any paralysis, paresis, or insufficiency of any eye muscle or set of muscles. In other words, it is not a disease. It is a normal, though unfavorable condition. It should be called an anomalous in contradistinction to a pathological declination. And, since anomalous declinations are frequent and pathological declinations are rare, the term "declination" when used alone should apply to the first class only, while to designate the tiltings from disease or injury the limiting term "pathological" should be added. Nor should the term "declination" be confounded with the term torsion, which has been applied to the rotations of the meridians when the eye passes from the primary and horizontal position to some position in which the line of re-

gard is directed to some point not in the primary position or horizontal plane.

These anomalous positions of the meridians are extremely common and are found in as many different classes of persons as are the anomalous refractive conditions of the eye. It is too early to state technically the precise physical conditions on which declinations depend. As a general statement, it may be said that they are peculiarities which are, doubtless often if not always, dependent upon the special conformation of the orbit in the individual case."

The writer then describes the clinoscope—an instrument for determining declinations, composed "essentially of two hollow tubes, each of which has at one end a minute pin-hole opening through which the eye can look, and at the other end a translucent disc on which is drawn a line, in the case of one tube from the centre straight up, and in that of the other tube straight down." This device excludes all view of surrounding objects and secures an absolutely erect position of the head.

This instrument is used in the following manner: The sight-holes are adjusted so that they are on a level with the eyes of the examined person when sitting erect. the tubes are brought to an exact level with each other as shown by the spirit level, and generally they are exactly parallel, though exceptionally they may be made to converge or diverge. No glasses should be used, unless presbyopia or high refractive error prevents the patient from seeing the test lines of the tubes; then the weakest correcting lenses are placed in the clips; a prism for the correction of hyperphoria may also be required. When a good view of both test lines has been secured, the patient should endeavor to unite them; if he does not succeed in this, the examination may proceed, though less satisfactorily, with the images separated. "When the apparent vertical position of the lines has been attained, the examiner should move them more or less backward and forward, in order that the true position may be more positively located. Few persons can arrive at a satisfactory conclusion regarding the position of the lines at the first trial, but after a day or two the tests become, for nearly all intelligent people, remarkably uniform."

Stevens then discusses the results of examinations with the clinoscope. One of the first results of the demonstration that the positions of the vertical and horizontal meridians leaned, when either leaned, in corresponding directions and to an equal extent, and that the leanings of the meridians were as varied and as characteristic of the individuals as the

refraction of the eyes; this contradicted the previous belief of physiologists that there was, in healthy eyes, a fixed and definite position for the meridians of the eyes and that this position was general if not universal. These leanings are called declinations and are to be distinguished from torsions, which latter term refers to the active adjustment of the eye, corresponding to the position to which the eye is moved. Declinations are purely passive states to be determined when the lines of regard are fixed in the primary position. They may vary, in healthy eyes, according to the automatic tension which may be exerted; hence very high degrees are more frequently manifest in persons passed fifty than in younger individuals; for the same reason there are variations depending upon the physical condition of the individual at different times.

"I have compared these anomalies of declination to those of refraction. As there are few eyes without some error of refraction, so there are few in which the insertions of the muscles are so ideal that there is no declination; and, as slight refractive errors may be disregarded, so slight declinations may have little practical significance. Even high degrees of declination seem in certain instances, like certain cases of high-grade hypermetropia, to exert no appreciable injurious influence. Yet, as a rule, as in refraction, the higher the grade of the anomaly, the greater the resulting nervous disturbance."

The relationship between declination and heterophoria, (sometimes simple, sometimes complicated), is then discussed. It was found that in exophoria there is, as a rule, positive declination of both eyes, the extent nearly equal in each; in many cases of hyperphoria, a declination of several degrees may be found for one eye while the other will be either without declination or with very much less than the first and usually of the same sign; in esophoria declination is almost uniformly found in both eyes, and the leanings of the meridians are homonymous—that is if plus for the right eye, it is minus for the left, the leanings usually being of the same extent and varying with the degree of esophoria. "Thus it appears that the different forms of heterophoria are associated with different forms of declination, and experience has shown that in a large proportion of cases a relief to the declination is followed at once by a relief to the heterophoria. In certain unusual cases it will be found that each eye will rise many degrees when a screen is placed before it. Even when any excess of upward rotation has been corrected the phenomenon remains. Here the upward turning is

due to the declinations of the opposite eye and it will remain even after the eyes are both too low, unless the declination is corrected."

The writer states that the principles which apply to the relations between heterophoria and declinations apply also to strabismus. In nearly every case of converging strabismus he finds not only excessive but extravagant upward rotation of the eyes—instead of 33° , often 50° . A reduction of this anophoria served, in a number of cases of marked squint to relieve the defect without interference with the laterally acting muscles. In nearly all cases in which there was a very excessive range of rotations in the vertical direction there were also unusual degrees of declinations—a condition which suggested the hypothesis that the excessive declinations combined their influence with the excessive vertical rotations to induce the strabismus. As a rule, there is excessive upward rotation with extreme homonymous declination with convergent squint. The same class of declinations are found in exophoria; and in hypertropia the conditions are similar to those of hyperphoria.

Regarding the local symptoms of declinations, many of these are similar to or the same as those attributed to heterophoria. One of the most common and persistent is dryness of the eyelids with smarting of the eyes, and a sensation of grit in them. Obstinate, chronic hyperemia, he believes to be due to pressure of the lids against the eyeball in an attempt to resist the tendency to roll. Reference is made to the writer's paper (*Ophth. Review*, Sept. '97) on anophoria as an etiological element of trachoma. Other symptoms are habitual pain in and over the brow of one or both eyes and arching of the brow on one or both sides, or arching on one side and flattening on the other. These symptoms, it is claimed, disappear when the declination is relieved.

Stevens discusses the facial expressions accompanying declinations. He mentions the three most conspicuous forms of expression about the brows, which when conspicuously present render it easy to recognize the class of declinations and to tell the direction of the leaning of each eye:

"In the form in which both brows slant or arch upward from the temples toward the median line, the internal extremity ending almost the general direction of the line of slant or suddenly curving down at the inner end, we may look for positive declinations for both eyes and of nearly the same extent. It is an expression which, some years ago, I associated with exophoria, but the more recent observations show that not only the expression but the exophoria itself has its cause in the direction of the meridians.

A second form of direction of the brows which is also most frequently associated with exophoria, but which is sometimes found with esophoria, is that in which each of the brows ascends from the inner extremity outward, forming what I have called "the bird's wing" eyebrows. Here the declination is positive for each eye, but the extent of the declination differs materially in the two eyes. Such a declination may, when the positive declination is quite moderate in one eye and is more decided in the other, give rise to esophoria, but the nearer the approach to equality of declination in the two eyes the greater the probability of exophoria resulting.

Again there is a form of expression which indicates homonymous declination with the positive leaning at the side with the compressed brow, and the negative leaning at the side on which the brow rises toward the temple. One of the common modifications of this form is that in which both brows curve strongly, but one is drawn much farther upward than the other.

It is easy to see that a great variety of modifications of these three forms of expression about this part of the face may arise from variations in the kinds and proportions of declinations in the two eyes."

The writer believes that unfavorable declinations might give rise to many disturbances of function and nutrition of the eyeball. Amblyopia found in apparently healthy eyes in which there is no squint, he believes dependent on this error and due to the ever-recurring confusion arising from partial diplopia. Asthenopia, also, is given as one of the common and characteristic symptoms.

Considering the general symptoms which he thinks due to the direct or indirect result of the ocular anomaly he mentions neurasthenia, habitual pose of the head and body, chronic pains at the base of the skull, between the shoulder blades or in the lumbar region, vertigo (even epileptoid), epilepsy, insomnia, dyspepsia, mental disturbances and many other forms of nervous irregularities.

Concerning treatment, Stevens considers surgical interference the only means of correcting declinations. Since a modification of the tension of the obliques is impracticable, the position of the eyeball must be altered by changing the direction of action of the recti muscles. He describes several methods of procedure which he has used at successive periods at considerable length. He reviews the process of evolution for his operations for declination (peri-tenotomy, circumtraction and extendo-traction) and gives full details of indications and methods of operating.

Light and Seating in the Schools.

Zimmermann, C., Milwaukee. (Jour. Amer. Med. Assn., Jan. 19, 1901.)

After a brief review of the investigations of Tobias Mayer, Aubert, Schmidt-Rimpler, Uthhoff, H. Cohn and others on the subject of the relation of sight and intensity of light, especially in reference to school hygiene, the writer states his views regarding the proper methods of illuminating school-rooms and seating the pupils.

Since insufficient illumination requires too close an approximation of the book to the eyes, thus fostering the development of myopia, Zimmermann mentions as a prime requisite a certain minimum quantity of illumination for school work. To determine this, the text-types of H. Cohn, which have a certain tint and should be read at six metres in sufficient daylight, are recommended. He states that the main source of illumination should be to the left of the pupil so that the hand casts no shadow on the writing. The glass area of the windows should have at least the proportion of 1 to 5 of floor area of the room, and the windows should reach to the ceiling. A sky light is very desirable if it can be obtained. The width of the school-room, that is, the distance of the windows from the opposite wall, must not exceed twice the distance between desk and upper window-sill. Since the best light is obtained from the sky, the surrounding buildings should be sufficiently low or distant that the extension of a line drawn from the desk farthest from the window to the edge of the lower window-sill will pass above the roofs. Windows facing south or east give the most intense light, but if the sun is annoying, the writer recommends the use of gray curtains on a pole fastened in the middle of the window, so that the upper or lower half may be darkened separately.

Where artificial lighting in schools is necessary, the author recommends a group of incandescent lamps with lightly ground glass, placed in the center of the ceiling, with a porcelain reflector above them. Several more may be distributed over the remainder of the ceiling and along the cornices.

Another important reform to which attention is called is the correct seating of the pupils. The bodies of the children should be in such a position that the point of gravity, which lies in front of the tenth dorsal vertebra, is in a perpendicular line above a base drawn through both seat-bones. To maintain this position with comfort, the desk and chair must have certain dimensions and relative positions, conforming to the size of the child, to which requirements the writer draws attention in detail. The forms of desks and seats which he has found to meet the demands best are those made by the

Chandler Adjustable Chair and Desk Company of Boston. A table of dimensions and measurements is given as a guide for the arrangement of the desk and seat; so that it is merely necessary to measure the height of the child and then to refer to this table.

Cases of Congenital Word-Blindness, (Inability to Learn to Read.)

Nettleship, E., London. (The Ophthalmic Review, March, 1901.)

The writer reviews Dr. Hinshelwood's recent report (Lancet, May 26, 1900), of cases suffering from inability to learn to read. The boys were described as bright and intelligent, but deficient in this one respect, that they could not learn to read, though having the power of remembering words that they had heard spoken. Other objects, such as faces and pictures, were recognized quite well. The auditory memory of letters, words, and numbers was excellent; but there was scarcely any visual memory for letters, there being ability to recognize only a few of the letters of the alphabet and an inability to read any words at all, even of two letters.

Hinshelwood ascribes this difficulty to congenital want of visual memory due to organic deficiency in the part of the brain where the visual impressions of letters and words are registered and stored. This speculative explanation is based on pathological evidence from cases in which, death having occurred some time after loss of reading power, changes have been found in the left supramarginal convolution and angular gyrus. Though this condition has attracted but little notice hitherto, he believes it is not necessarily or even probably of rare occurrence; and if even moderately frequent, it has considerable importance.

Nettleship gives the histories of five additional cases. He calls attention to the fact that eight of the nine subjects were males. Continuing he says: "Whatever may be the anatomical cause of this condition, its importance from the educational point of view, both positively and negatively, is obvious. If the defect be curable, the remedy will doubtless be found in methodical and persevering instruction in reading, begun at the earliest possible age, whilst the brain cells and fibres are still capable of marked development. Assuming some capacity for improvement, which may be expected to vary with the degree of congenital deficiency in the brain organ of visual memory, it may be that the old plan, by which the chief part of every child's education consisted in teaching him his letters, would give a word-blind child a better chance of improvement than do some of the modern methods. On the other hand, if the defect be irremediable, the sooner this is recognized for each child the better, both

for him and his teachers. It would seem, therefore, that the best way of detecting congenital word-blindness, and deciding whether, and to what extent, the defective faculty can be improved, is to stick to the old plan of teaching children their letters as early as possible. The probability is that slight cases can be very much improved by early training; but several of the examples referred to, or now given for the first time, seem to show that when the defect is great, even the best and most persevering efforts may be of little avail in developing the wanting faculty. In such severe cases, it may be best, after reasonable efforts have been made, to abandon the attempt at teaching the child to read, and to educate him on other lines.

The detection of congenital word-blindness is easy in the children of well educated parents, whose young children receive much individual attention. It must be much more difficult, both to recognize and deal with, in the children who crowd infant elementary schools. That the condition has been differentiated, and is receiving attention from medical men, should lead presently to its being dealt with by tutors who devote themselves especially to backward children, and by the teachers in all infant schools. The education of "backward" and "defective" children, by more or less special methods, is already receiving more attention than formerly. If from amongst such children, those can be sifted whose only, or principal difficulty is real inability to read, the result cannot but be useful both to the individuals and the community."

On the Circulation and Diminution of Tension in Atrophic Eyes.

Ischreyt, G., Riga. (*Archives of Ophth.*, Jan., 1901.)

The writer points out the fact that investigations concerning the tension of the eyeball, have, in most cases, embraced increased tension only; the subject of hypotony has not been investigated experimentally. He cites a few papers which contain statements referring to the probable causes of hypotony in atrophy of the globe. The eyes which he studied were all derived from young subjects, and all seven presented the clinical picture of iridocyclitis.

After giving the histories of these cases and the changes in the eye in each case, the writer devotes short chapters to a consideration of (1) the general character of the uveitis. (2) the hyperemia of the anterior ciliary veins, (3) the choroidal vessels, (4) compensatory endarteritis, (5) secretion and outflow, and (6) contraction of the sclera. He recapitulates the results of his investigations as follows:

"Since the intraocular tension depends upon the relation between influx and outflow of liquids, a disturbance

in its normal condition can arise only through a disturbance of this relation.

It has been shown that the condition of increased tension may be brought about by interfering with the outflow when this interference is so great that it is not compensated for by the diminished influx. If the disturbance has once taken place, there is added an increased secretion brought about by this cause. Both these factors unite in bringing about the condition known as absolute glaucoma.

While in many conditions of hypertony the disturbed relation between influx and outflow depends primarily upon an interruption of the outflow and rarely upon a primary hypersecretion, it is natural to assume that hypotony is primarily brought about by a diminished influx, and investigations on atrophying eyes reveal indeed marked injury of the secreting portion of the eye—the ciliary processes.

As long as the diminution in secretion is slight, there may be compensation through other portions of the secreting area increasing their activity; furthermore, the lack of aqueous humor may be compensated for by a contraction of the elastic capsule of the eye. But if the diminution of secretion is considerable, hypotony becomes manifest. Slight causes may be sufficient to destroy the balance. While the normal channel of exit—the plexus venosus ciliaris—is free, and the hypotony at the most has caused only a slowing of filtration, the destruction of the ciliary processes and the iris forces the blood of the anterior and long posterior ciliary arteries into new channels and thus gives rise to an increased anterior venous outflow; the diminution in tension and the increasing collapse of the ocular capsule remove the pressure from the vessels entering the venae vorticosae and allow them to dilate; the more the pressure sinks, the easier is the venous outflow. Here also a vicious circle develops; it results in the condition known as atrophy of the ball.

The rapid and unchecked outflow of the venous blood prevents any diminution in the arterial current, and thus no secondary, compensatory endarteritis develops.

As regards the question of the compensatory arrangements in the eye, it seems probable that the anterior venous channel of outlet acts as a regulator of the circulation in the anterior segment of the ball; in case of interference either in the venous or the arterial area the excess blood is easily carried by through these channels."

Ocular Manifestations of Diabetes Mellitus.

Alleman, L. A. W., Brooklyn. (Jour. Amer. Med. Assn., Jan. 26, 1901.)

The writer briefly examines the relation of the more im-

portant ocular symptoms of diabetes to the primary disease. He remarks that, while ocular lesions may be present in all forms of diabetes, they are more frequently found in the chronic cases without marked general disturbances. Not infrequently the diabetes is only revealed during an examination of the refractive condition, which is subject to changes in diabetic patients. It may be diminished, causing or increasing a pre-existing hyperopia, which phenomenon is due, according to Landolt, to a change in the index of refraction of the vitreous. The development of myopia he considers much more common, and may accompany changes in the lens, or may even be seen when no evidence of cataract is present.

The writer then discusses the occurrence of paralysis of the extraocular muscles, which may occur in the mild as well as severe cases of diabetes, and are to be ascribed to nuclear or peripheral hemorrhages. He considers paralysis of accommodation as perhaps the most frequent of the ocular complications and sometimes the first symptom of diabetes to manifest itself, so that a rather quickly developing change in refraction should arouse a suspicion of diabetes. He inclines to the belief that in patients beyond middle life, the influence of diabetes on cataract formation is through the general nutritive disturbance and arterial degeneration by which it is accompanied; but in the young there seems to be some direct causal relation.

In regard to the ocular symptoms of diabetes found in the retina, he agrees with Hirschberg, who, after careful study of the subjects has claimed that there is a distinctive diabetic retinitis, presenting in most cases a degenerative or a hemorrhagic type, and possessing features which distinguish it from other forms of retinal disease. Retinal hemorrhages are always suggestive of diabetes, particularly the small punctate ones; these are often associated with conjunctival hemorrhages which are absorbed and recur. In regard to the significance of these retinal lesions, he does not share the view held by some authors, that they are indicative of the terminal stages of the diseases, as is the case in albuminuric retinitis; for he has known diabetics to live many years with recurrent retinal hemorrhages. Another important ocular symptom mentioned is central scotoma, which is almost identical with the clinical picture of tobacco amblyopia, differing principally in the etiology. Plastic iritis, keratitis, optic nerve atrophy, and amblyopia are also briefly touched upon.

The writer concludes with the remark that the eye symptoms are, on the whole, of far more diagnostic than prognostic significance. Nearly all of them are seen both early and late in the disease; they are indications of existing nutritive conditions, rather than of the extent of the irreparable damage done to the organs.

ABSTRACTS FROM ENGLISH COLONIAL OPHTHALMIC LITERATURE.

BY FRANK ALLPORT, M. D.,

CHICAGO, ILL.

(QUARTER ENDING MARCH 31, 1901.)

Case of Metritic Iritis.

Pushong, Dr. Edward S., (Indian Med. Rec., Dec., 1900.)

The patient was 45 years of age, a healthy woman with no history of rheumatism or syphilis. She had suffered from attacks of neuralgia at her menstrual periods and at the time of the present attacks was two months pregnant.

She complained of most agonizing pains in both eyes which had come on suddenly the day previous. On examination both corneae were dimmed and faintly spotted. There was slight increased tension, the pupils were slightly dilated and regular and there was loss of lustre of the iris but no perceptible adhesions.

A few drops of a ten per cent solution of cocaine were dropped into the eyes. This produced an alarming result, the patient shrieked with greatly increased pain and left the office. She consulted another physician who used the same treatment with the same result.

Dr. Pushong was called in the evening and thinking it might be a case of metritic iritis found the ovaries and cervix very tender and prescribed a uterine tonic. After the first dose the patient was better and in four days she was well. (The case was probably of hysteric nature.—Ed.)

Prognostic Value of Iritis Syphilitic.

Trousseau, Dr. A., (Indian Med. Record, Dec., 1900.)

The appearance of eye symptoms in the course of syphilis is always an indication of a severe attack of the disease. The iritis itself usually readily yields to treatment, but the syphili-

tic complications are serious. The author has seen sixty-one cases of syphilitic iritis and in only six could the course of the disease be called mild.

Six cases are cited as characteristic. They all present the common feature of early iritis, which tends to relapse and leads to other ocular affections and later on to grave cerebral or spinal lesions.

One case, a man aged 38, suffered from acute irido-choroiditis about six weeks after contracting syphilis. The eye affection relapsed twice in the following year and two years later was followed by retinitis.

Four years after infection he had a cerebral attack with persistent hemiplegia.

Another case, a man, aged 55, suffered from irido-choroiditis one month after infection. Mercurial inunctions improved the eye, but a cutaneous eruption and mucous patches developed. Four months after infection double optic neuritis was detected and one month later a cerebral gumma. In spite of active treatment hemiplegia followed.

A Case of Congenital Ptosis with Associated Movements of the Affected Eyelid During the Action of Certain Muscles.

Maccallum, Dr. James., (Canadian Journal of Medicine and Surgery, Vol. VIII. No. 6.)

The case was a woman 25 years old, who has had a drooping of the right upper eyelid since birth. The lid is lifted when she opens her mouth or shuts her teeth tight or chews, or when she presses her finger forcibly on the upper lip or closes her left eye. The range of movement of the right eye is limited upward, upward and outward, and upward and inward. The vision in both eyes is normal. There is no anomaly of the pupil nor other ocular defect, except the ptosis and the limitation of the ocular movements. There is no defect of muscular development because the lid can be lifted under certain circumstances.

The affected muscles (the levator palpebrae superioris, the superior rectus, the internal rectus, and the inferior oblique), are all innervated by the third nerve. It is hard to conceive of any defect in the motor oculi nerve which would cause the muscle to act at one time and prevent it from acting at another.

Those muscles during whose action the lid is raised are innervated by the facial and trigeminus nerves.

In this case, therefore, a nervous excitation in the area of the trigeminus or facial in some way reaches the levator palpebrae superioris and raises it. The strands to the levator of the right side must arise in the facial or motor nucleus of the trigeminus, or both.

A Case of Thrombosis of the Cavernous Sinus.

McDonald, Dr. Stuart., (Indian Med. Record, Oct., 1900.)

The patient was a boy 16 years of age. On February 16 he came home from work ill, complaining of a pain in his side, and feeling feverish. He had never had any previous illness of importance. He was examined by a doctor who found symptoms of pneumonia; his temperature was 104° F. He complained of his left eye, which presented the appearance of a catarrhal conjunctivitis. There was no history of any injury. On the 4th of February exophthalmos of the left eye was noticed for the first time and on this evening the patient was delirious. Dr. McDonald saw him the next day and suspecting either retro-bulbar abscess or cavernous sinus thrombosis, passed a Graefe knife above and below the globe to the back of the orbit. No pus was obtained and as the patient was getting rapidly worse he was sent to the hospital.

On examination there was well marked exophthalmos of left eye with great tenderness of the globe on pressure, there was great edema of both upper and lower eyelids on the left side, and on that side of the nose, the eye was covered with sero-pus and conjunctiva injected, but the cornea was clear, the pupils were dilated and equal, they reacted sluggishly to light; the movements of the left eye were impaired in every direction, but there was no actual paralysis of any muscle. The patient apparently could not see at all with his left eye. On ophthalmoscopic examination, there was well-marked acute optic papillitis on both sides, best marked in the left eye where the veins were also much dilated, the discs were greatly congested.

The patient grew rapidly worse and died seventeen hours after admission to the hospital.

Post mortem: On opening the cranium the vessels of the membranes were congested, there was no thrombosis of the longitudinal or lateral sinus, the vessels on the surface of the brain were markedly congested, there was plastic meningitis all over, there were no abscesses or hemorrhages in any part of the brain. The left cavernous sinus was opened and found to contain a drop or two of pus and pultaceous matter; there was no ordinary thrombosis and the bone around the sinus was not stained.

The case presented a clear picture of acute general pyæmic infection, from suppuration in the orbit. The absence of a definite thrombosis in the sinus, the author thinks, may have been due to rapid disintegration of the clot.

Treatment of Night-Blindness by Ingestion of Liver.

Buchanan, Dr. W. J., (Indian Medical Gazette.)

This complaint is very common in India, especially among the

end of the rainy season. It is usually accompanied by a pigmented scaly condition of the conjunctiva, a xerosis. The author quotes five cases, all prisoners in the jail and all well strong men with one exception. Their only complaint was that they could not see their way about after sunset. They were given about 8 ounces of goat's liver fried with oil and spices, each day; no drugs, and no other treatment.

Case 1. In jail ten months; had had fever but recently improved and was well, spleen not enlarged, no anaemia, no spongy gums. The patient complained that for the past two months he could not see his way about after dark. There was a xerosis of the conjunctiva, but no retinal changes. His day vision was good. He was put on the liver treatment and after 48 hours he was greatly improved and after ten days was cured. There was no relapse.

Case 2. The patient was 30 years old, fat and well. He had had malarial fever in '99. He was suffering from night blindness which had lasted for about two months. There was a pigmented xerosis on both sides of both corneae. He was put on the liver treatment and the improvement was marked and immediate. He was discharged cured on the tenth day. No relapse.

Case 3. Twenty-two years old, 13 months in jail; he had had stomatitis, fever and had been in the hospital for various diseases at different times. He complained of an increasing night blindness which has been coming on for the past two months. His comrades would lead him about after nightfall. He was put on the liver treatment and in a few days was greatly improved and afterwards cured. No relapse.

In an editorial on this subject the relation of the disease to scurvy is discussed. It is noted that it is by no means necessary that the patients be in the cachectic state, the disease is met in cases of liver disease, anaemia, pregnancy, and chronic alcoholism, but also in perfectly well individuals. These defects of nutrition are probably only contributory causes, the real cause being the glare of the sun.

It has been called "glare retinalgia," and it is met with most frequently among crews of war ships cruising in tropical waters, i. e., exposed to glare. Instances of nyctalopia were first noticed in scurvy patients but scurvy patients are not night blind unless exposed to bright light. Men, working in the glare of iron foundries are often affected.

Conjunctival xerosis is so often associated with night blindness that it is considered a part of the disease. The natives of Bengal smear liver fat on and around the conjunctiva and cure the xerosis and the night blindness.

M. Donald Gunn says "night blindness is a functional disorder depending primarily on exhaustion of the retina from prolonged exposure to bright light. Any cause that lowers the general vitality will tend to accelerate the incapacity of the retina to respond to less than the strongest stimuli."

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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AND

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(QUARTER ENDING MARCH 31, 1901.)

The Prognosis and Therapy of Infected Wounds of the Eyeball.

Dr. O. Shirmer, of Greifswald. (Münch. med. Wochenschrift, Feb. 12, 1901.) The author reports 160 cases of perforating wounds of the eyeball. Sixty-nine of these were aseptic wounds and sixty of these sixty-nine were saved with some vision. In four cases the eyeball was so torn to pieces that it was deemed best to enucleate at once, while in two cases the enucleation was performed somewhat later. In three cases a phthisical stump was left which was free from irritation. Among the ninety-one infected wounds forty-five were purulent in character, and the inflammation in the remaining forty-six was of a chronic fibrinous character. The conclusion reached by Shirmer is that the conservative treatment must always be tried unless the eye is absolutely lost and an eye can only be pronounced absolutely gone when it is either completely torn to pieces or presents the picture of panophthalmitis. Of the forty-five infected eyes twenty-two were subjected to exenteration. Of the twenty-three which were treated conservatively twelve obtained good vision. The forty-six cases which were affected with a fibrinous inflammation were all subjected to the conservative treatment. Twenty-one of these obtained some sight, five went blind and in the other cases enucleation was subsequently found necessary. Sympathetic ophthalmia was not seen in a single instance. The good results he attributes in large measure to the use of mercury usually in the form of inunc-

tion from 6—9 g. a day and rest in bed. Subconjunctival injections were tried, so also diaphoresis, atropine and bandage.

A Case of Diffuse Keratitis from Acquired Syphilis.

Dr. Fritz Mendel, (*Centralblatt für praktische Augenheilkunde*, Januar, 1901.) The case was that of a young man whose mother was a syphilitic and who in the first year of life had survived an attack of congenital syphilis. In his twenty-second year he acquired syphilis. A very interesting point is opened up here as to whether an individual who has had congenital syphilis is immuned against a later infection. Most authors believe that a person who has recovered from congenital syphilis can be infected later. Such certainly was the history of the case reported by Mendel, for the patient had passed successfully through an attack of congenital syphilis and became infected afresh twenty-one years later. Both eyes were affected with a typical diffuse keratitis. This trouble disappeared under energetic inunction. Six years later it broke out again under the guise of an episcleritis which also disappeared very rapidly under inunction.

Tetany and Cataract.

Prof. Peters of Bonn. (*Zeitschrift für Augenheilkunde*, Feb. 1901.) It will be remembered that 2 years ago Peters made a communication upon this subject in which he maintained that there was close connection between convulsions and certain forms of cataract. In his last communication he discusses the question exhaustively. He touches upon the frequency of zonular cataract in rickets and gives statistics which he thinks justify us in concluding that these cataracts are more often due to tetany than to rickets. He reports four more cases of tetany in which zonular cataract was observed. Two of these children belonged to one family and their mother had repeatedly suffered with puerperal convulsions. Two of the children had had repeated attacks of convulsions. The older one (8 years old) had begun to have convulsions in its second year, and at the present time there are numerous fine striations in the periphery of the nucleus. The sister (four years old) who was also subject to occasional attacks of convulsions had very marked cataractous changes in the nuclear portions of the lens. Forty per cent of the cases of tetany observed by Peters were affected with cataractous changes in the lens. He does not discuss the question as to how tetany produces these changes.

Dionin in Ophthalmic Practice.

Dr. Ludwig Vermes. (*Wochenschrift für Therapie und Hygiene des Auges*, 7 Februar, 1901.) The author has given

us an analysis of 101 cases in which he used dionin an account of which product has been already given in a recent number of the "Annals of Ophthalmology." The troubles for the most part were external diseases of the eye, such, for instance, as the various kinds of keratitis, conjunctivitis, etc., including spring catarrh. Similar to Wolffberg's experience Vermer obtained the best results in corneal affections except where this affection was not caused and kept up by a conjunctival disease. His results as a rule were excellent in corneal troubles. He reports a case of pannus in which the cornea was completely cleared up with dionin but it seemed to have little or no effect upon the conjunctival process. In two cases of "spring catarrh" it relieved the itching but made little change in the anatomical condition. Bacteriological experiments showed that it possessed in some degree antiseptic properties. He sums up his analysis in these words: The value of dionin is not to be questioned in diseases of the cornea not caused by a conjunctival affection, also in diseases of the iris and ciliary body and in these it should be combined with mydriatics.

The Change in the Refraction of the Eye When the Lens is Removed.

Dr. Treutler (Zeitschrift für Augenheilkunde, Jan., 1901.) Treutler's communication ends with these conclusions. (1) An emmetropic eye after removal of the lens has a refraction which is equivalent to 10.5 D. (2) A myopic eye of -15 D, from which the lens has been removed has a refraction equivalent to 2.50 D. (3) A myope of 20.0 D becomes emmetropic after removal of the lens. By refraction is meant "glass refraction," and refers to a correcting lens at a distance of 12 m. from the corneal apex.

Ocular Emphysema.

Professor Fuchs. (Wiener Klinische Wochenschrift, 1901, 4.) The author describes emphysema as it occurs in the lid, orbit and conjunctiva. Rarely do we have emphysema of the conjunctiva. The conditions which determine emphysema in the eye are: (1) A communication between air conducting cavities through a gap with interstitial spaces of connective tissue in the lids, orbit and conjunctiva. (2) The driving of air out of these cavities through the agency of expiration. (3) The absence of an open wound on the external surface through which the pent up air can free itself by the shortest route.

The air conducting cavities in the region of the eye are the nares and their surrounding cavities. The opening of the bony walls which separate these cavities can follow direct

violence from without. The cases which we generally see, however, are where a rather slight blow has been received in the neighborhood of the eye. In order to get emphysema the air must be driven into the tissue and this generally happens from blowing the nose, during which process strong expiration is made, the nostrils being closed. At this time the air is driven into the tissues and so we get the emphysema. The author then describes in detail the various kinds of injury which lead up to emphysema. He alludes to so-called spontaneous emphysema caused by blowing the nose, but in this case Fuchs thinks that a lesion is to be sought for in the lamina papyracea in which variety of cases we will have the emphysema showing itself first of all in the orbit. He explains the liability of the lids to emphysema by the fact that they are always very much relaxed, thus offering very little resistance to the pressure of air. The prognosis is good and he advises a compress bandage and the avoidance of blowing the nose.

Monocular Neuritis Optica Which Disappeared With the Removal of Adenoid Vegetations.

Dr. Königshöfer of Stuttgart. (Die Ophthalmologische Klinik, 5 Januar, 1901.) The patient was a young woman of twenty-one years who complained of a fog before the right eye. She had long been a sufferer from nasal catarrh and had a decided nasal twang to her voice. An examination of her eyes showed that her left eye was normal, but that the vision in her right eye was considerably diminished. There was also narrowing of the visual field and marked disturbance of the color sense. The ophthalmoscope revealed swelling of the disc in this eye and some tortuosity and engorgement of the veins. The general examination revealed nothing which cleared up the etiology; everything being apparently normal with the exception of the pharyngeal vault, which was choked up with enormous adenoid vegetations. The usual remedies were employed for the optic nerve trouble; such for instance as inunction with mercury ointment, warm baths and the internal administration of the iodides but all with apparently little effect. The adenoid vegetations were then removed and in a month the eye symptoms had entirely disappeared, in spite of the fact that during this month the patient passed through a severe attack of grip. The adenoid vegetations evidently caused a great disturbance in the orbital circulation, especially of the right orbit. In this way a point of less resistance was produced which point later on became the seat of an infection probably of influenza. The removal of the adenoids of course restored the

circulatory conditions of the orbit to the normal, and the eye changes at once disappeared.

Prognosis and Treatment of Traumatic Dislocation of the Lens.

Dr. P. Stoewer, (*Zeitschrift für Augenheilkunde*, März, 1901.) The author reports and analyzes 10 cases, of this character. Of these 10, 3 escaped attacks of either glaucoma or cyclitis. Two of these, however, remained under observation for only 2 weeks and hence cannot be considered in this communication. In the other 7 the luxation was followed by attacks of glaucoma. Two of the eyes which were treated with myotics became blind. The prospects then of eyes, in which the lens has been either completely or partially dislocated, remaining free from glaucomatous attacks are very slight. He lays down the following rules as regards the treatment of this class of cases. When the lens is dislocated into the anterior chamber it should be extracted as soon as possible. If the lens is caught in the pupil if possible it should be manipulated into the anterior chamber and then removed. When the luxation is into the vitreous body and has been followed by no marked or persistent irritative symptoms myotics may be employed and operative measures refrained from for a while at least. Extraction should be performed, however, on the first symptoms of either glaucoma or cyclitis or sympathetic ophthalmia. First of all an attempt should be made to get the lens into the anterior chamber by manipulation. If glaucomatous attacks appear and the media are so cloudy as to prevent satisfactory conclusions as to the location of the lens sclerotomy must be performed. Sympathetic inflammation calls for enucleation, also the presence of a cyclitis which has followed an unsuccessful attempt at extraction.

Massage In Ophthalmology.

Prof. Elschnig of Vienna, (*Münch. Med. Wochenschrift*, 5 März 1901.) The author expresses himself enthusiastically over this method of treating certain eye affections, particularly trachoma. The method gives beautiful results in those chronic forms of trachoma where the tarsus is much thickened and where the conjunctiva has undergone a great deal of cicatrization. It is indicated also in cases of pannus and corneal ulceration. A few weeks of this treatment sufficed in a number of cases to restore useful eyesight. The massage is performed with a glass rod, on the end of which is a pledget of cotton which has been dipped in a solution of hydrarg. oxycyanat. 1 : 4000. The rod is passed under the lid and rubbed well over the surface while pressure is made from without over the

same point with the index finger, a certain amount of force being employed, but not enough to injure the surface of the mucous membrane. Early in the treatment the massage should be practiced every day, and later every other day. The sitting should last five minutes. Elschnig has never seen any injurious effects from this method. He recommends the treatment especially in those forms of chronic catarrhal conjunctivitis where there is more or less secretion, and where there is evidence of stagnation in the secretion of the meibomian glands. In "spring catarrh" he suggests that the massage be practiced directly upon the little nodules. He has seen equally good results in phlyctenular conjunctivitis and dacriocystitis, and in those cases where there is either blood or an exudate in the anterior chamber. He has also seen good results in hemorrhages from the retinal vessels and in thromboses of the retinal vessels.

A Case of Granular Conjunctivitis of Syphilitic Origin.

Dr. Inouye, Japan. (*Die Ophthalmologische Klinik*, 20 Jan., 1901.) The author first refers to 2 cases of this character which were reported by Goldzieher in 1888, these latter being the first which had been put on record up to that time. Sattler and others report somewhat similar cases, but it must be said that they are very rare. Inouye's case is as follows: The patient was a young woman of twenty-five, who when first seen, gave every evidence of being in the secondary stage of syphilis. She complained of the right eye, though with the exception of a little redness there was nothing noteworthy to be seen. The conjunctiva of the lids and retrotarsal folds were uniformly congested, and this was particularly marked at several points, as, for instance, downward and outward. In the outer half of the lower fornix there were to be seen diffuse yellowish red elevations, and the same change was present in the inner half of the upper transition fold. The tarsal conjunctiva was free from changes. Otherwise the eye was normal. None of these changes were to be seen in the fellow eye. The patient was put on the usual constitutional treatment, and locally moist warm boric compresses were applied with an occasional drop of cocaine. The granules on the retrotarsal fold began to grow larger, and to invade the bulbar conjunctiva and the cornea became involved. After inunction treatment brought about improvement, and when she was dismissed the conjunctiva was practically normal. The changes seen in this case closely resemble those seen in the later stages of trachoma, but differed from the latter in that none of the coincident changes seen in the latter were present, seen, for instance, as papil-

lary proliferation and scars in the conjunctiva. Then, too, Inouye's case was of recent standing, differing in this respect from trachoma. It differed from trachoma in general, in that it showed neither papillae nor granules in the tarsal conjunctiva that during all this time the left eye showed no disposition to participate; in other words, was not infected as we would expect in trachoma, and that finally the disease disappeared with practically no local treatment.

Prophylaxis of Myopia.

Prof. Königshöfer. (Wochenschrift für Therapie und Hygiene des Auges, No. 20, 1901.) The prophylaxis of myopia presents the widest field in the prophylaxis of functional disturbances. The following are some of the rules which the author lays down:

In reading, writing and sewing a distance of at least 1-5 m. must be maintained and any oblique position of the head should be avoided. A reduction of the illumination, or of the size of the letters, is only permissible so long as the point is not reached, where the eyes are subjected to a strain. Near work should not be kept up for a long time. The author then speaks of the position of the body, and lays a great deal of stress upon this point. He refers to the various devices for supporting the head, the chest, the chin, etc. He prefers a contrivance which keeps the trunk in an upright position. This apparatus he describes in detail. He warns against reading on the cars and in the twilight. School life should not begin till the end of the seventh year, and during the first year no more than eighteen hours a week should be occupied. Near work should never last more than one-half hour at a time. After every school hour there should be a pause of one-half hour, and there should be a systematic "turn about" from near work to other things. Even in the highest classes no more than forty-six hours a week should be occupied. These rules, of course, apply to those in whom there is either a tendency to myopia or who already have some myopia. Those cases which show a steadily progressing myopia must throughout life do as little near work as possible. The author then speaks of the great importance and of the especial care necessary in the observance of these rules on the part of those in whom there is an hereditary tendency to myopia. He refers to the tendency among many ophthalmologists nowadays to correct all of the myopia (for far and near) when it does not exceed six or eight diopters. He proceeds as follows when the myopia is under six or seven dioptres. He makes a full correction for the distance, but for the near he never corrects in full but pro-

vides the patient with a glass which allows him to work comfortably at from 30 to 40 cm. In cases where the myopia is less than three diopters he advises the patient to discard glasses for near work. In the higher grades of myopia the author never gives full correction even for the distance, and he ends his interesting dissertation with this piece of advice, the greater the myopia so much the greater must be the uncorrected part of the myopia.

Necrotic Scleritis of Traumatic Origin.

Dr. A. Levy. (*Klinische Monatsblätter für Augenheilkunde*, December, 1900.) The case was that of a man who had been struck in the left eye with a piece of wood. The wound was in the conjunctiva, and was about one and a half mm. long. It extended into the sclera and had thickened, smooth borders. A few days after the accident a blenorrhoea of the lacrimal sac developed in this eye and infection of the conjunctival wound was prompt, the borders of the latter taking on a dirty gray color and resembling the appearance presented by diphtheritic or necrotic tissue. The tear sac was extirpated and the wound from this operation healed per primam. The point of injury, however, still presented the same appearance, and the surrounding tissue was much swollen. At this point there was a distinct yellowish nodule, which was excised. Cultures from this location showed staphylococci and xerosis bacilli. After this the trouble subsided, but reappeared in a week. A few days later the symptoms again subsided, but later on the inflammation assumed a still more violent type, and the nodule increased in size till it was almost as large as a hazel nut. Pain was constant and severe. The usual remedies were tried in vain, such, for instance, as sod. salicylate, mercury and the iodides. Finally the galvanic current was resorted to, and this was practised every day for a half hour at a sitting. Complete cure followed this measure. The case is especially interesting, because we had as a result of a small conjunctival wound involving the sclera a necrotic chronic fugitive episcleritis with all the characteristics of pure scleritis, while the iris and conjunctiva were secondarily involved. In spite of the treatment the process seemed to involve the entire eye. When the trouble disappeared there was left behind a bluish gray discoloration of the sclera with adhesion of the latter to the conjunctiva, conditions which we so often see in ordinary episcleritis. The cause of the inflammation must be sought for in all probability in the dacriocystitis with consequent infection of the episcleral tissue. The author discusses the various theories regarding episcleritis and its

treatment, and dwells particularly upon the value of the galvanic current in this class of cases.

A Case In Which the Ciliary Processes Were Plainly Visible in the Pupillary Field.

Professor Eversbusch. (Münch. Med. Wochenschrift, 8 Januar, 1901.) The patient was a woman of twenty years, who sought the advice of the author for what she thought was a cloudy cornea. It was found, however, that the whitish appearance had its seat in the lens—in other words, that she had cataract, which undoubtedly dated back to childhood. The cataractous lens had shrunk in both diameters. As a result there was a lengthening of the ciliary processes entirely around the lens. This lengthening was somewhat more marked at the lower and nasal border and less marked at the upper and temporal border. These little prolongations lay so close together as to barely permit here and there a red reflex. There were forty-six ciliary processes counted. It will be recalled that the text-books put the number of ciliary processes at from seventy to eighty. He considered the various methods of operating in this class of cases, and finally determined to make a small incision below. Into this wound and up into the anterior chamber he passed a dissection scissors and simply divided the cataract, which separated each half, withdrawing to either side and leaving a large black pupil.

Subconjunctival Injections of Salt Solution in Detachment of the Retina.

Dr. Winselmann. (Die Ophthalmologische Klinik, 5 Feb., 1901.) The following cases are reported by Winselmann: The first case was a man of forty, who had suffered for a long time with chronic irido-cyclitis. The left eye had gone blind suddenly from detachment of the retina and had been in this condition for three years, and when he consulted Winselmann the complaint was that he had gone completely blind a few days previously. With the right eye he could see movements of the hand in $\frac{3}{4}$ m., while he had light perception in the left eye. The ophthalmoscope showed total funnel-shaped detachment of the retina in both eyes. The patient was put to bed and a Pravaz syringe half full of salt solution was injected under the conjunctiva and a compress bandage applied. The next morning the patient said he could see as well as ever, and a glance with the ophthalmoscope showed that the retina had reattached itself. Nine injections were given in all. The injections were given every other day, and a certain number of injections were made into the conjunctiva of the other eye. When the patient was dis-

charged the right eye showed a vision of $6\frac{1}{2}$ m., and with the left eye he could count fingers in $\frac{1}{2}$ m. No retinal detachment could be made out. The injections were continued, and when the patient was finally discharged the vision in the right eye was 6-7.5, and with the left eye he could count fingers in 1m. The second case was a traumatic detachment in which the detachment was a localized one, and the vision was reduced to 6-25m. After six injections of a two per cent salt solution (entire syringe full) the vision had mounted to 6-10. The last case was a spontaneous detachment with vision 6-24. Compress bandage with salt solution injections were ordered. The next day the patient had perfect vision and no retinal detachment was visible. Some weeks later the man returned to work. The cure has lasted thirteen months in the first case, and time alone must throw light upon the permanency of the cure in the other cases.

A Cilium Implanted In the Anterior Surface of the Iris.

Dr. Rübel. (Wochenschrift für Therapie und Hygiene des Auges, den 10 Januar, 1901.) The case was that of a mechanic who had been struck in the eye with a piece of steel. At the lower inner quadrant of the cornea and near the scleral border there was to be seen a wound about 8mm. long. There was a prolapse of the iris at this point, and the anterior chamber was full of blood. The lens was apparently uninjured, and after the blood had been nearly absorbed there was plainly seen a foreign body in the anterior chamber almost surrounded by blood. The end of this foreign body was adherent to the anterior external surface of the iris, while the other end floated. The presumption was that it was a hair, and a few days later, when all the blood was absorbed, it was found that this was actually the case. Irritative symptoms were only present for a short time, and as the patient refused an operation for the removal of the hair, it was allowed to remain, and during the six years that the patient was under observation it gave no trouble. It was clearly seen that the hair had its seat at the external pupillary border and passed upward and inward and disappeared behind the pupillary border on the opposite side. There was no movement of the cilium when the body was moved, but during pupillary movements there was a noticeable movement of the free end of hair. The author has not noticed this movement of late, which he thinks is probably due to the fact that what was once the free end of the hair is now adherent to the anterior surface of the iris. There was no visual disturbance.

Optic Nerve Coloboma and Conus Downward.

Professor Elschnig of Vienna. (Archiv für Ophthalmologie, LI Band, 3 Heft.) The author's conclusions are based upon a thorough anatomical examination of six cases, and are as follows: The downward conus, and no doubt conus in other directions, are not to be explained as remains of the foetal ocular fissure, but as the evidence of a stretching of the ocular membranes of either one or the other half of the eye, which in its turn is caused by defective conformation of that half. The abnormal extensibility of one side of the eyeball is caused by imperfect development of the same since the relative thinning is disproportionately great in comparison with the grade of the stretching. The remarkable frequency of this anomaly in the lower half of the eyeball no doubt indicates its probable connection with the foetal ocular fissure. The coloboma at the edge of the optic disc with or without any malformation of the nerve situated below and containing no retinal structure is sometimes the remains of the ocular fissure, but situated elsewhere it is to be regarded as a defective development of the headplates, caused by abnormal sprouting of the borders of the secondary ocular vesicle in the foetal ocular fissure or on the border of the optic nerve. Through the stretching of the less resistant portion of the eyeball included in the coloboma we get that peculiar cyst-like ectasia in the colobomatous area, and which is the characteristic ophthalmoscopic picture of coloboma so different from what we see in the formation of conus. It is not possible in all cases to differentiate between a conus and a coloboma. After all, the situation of the surface of the conus is the criterion. If the base of the sickle-shaped area is situated in the border of the surrounding eyeground, we are most probably dealing with a conus. If the base, however, is ectactic, we have a coloboma. The smaller the white sickle-shaped area, and the more perfect the sickle shape, the more apt is it to be a conus. When the sickle shows marked irregularities and is large we are always dealing with a coloboma. The author promises us further interesting observations in this connection.

A Hitherto Undescribed Affection of the External Canthus.

Dr. Camill Hirsch. (Centralblatt für praktische Augenheilkunde, November und Dezember, 1900.) The author devotes considerable space to the consideration of an affection which he has observed in nine individuals. The chief characteristics of this disease may be seen from a description of the first case. Both eyes presented marked irritative symptoms, there being injection of the

bulbar conjunctiva, especially in the periphery. The conjunctiva of the lids was swollen, red and contained numerous follicles in the transition folds. The cilia were long and strong. At the outer end of the upper lid a group of eyelashes, instead of following the normal course, grew directly downward and backward, crossing over the lid angle and were lost behind the free border of the lower lid. It was not possible, moreover, to free these cilia from their location by forcibly pulling the lids apart. It appears that these cilia were, so to speak, imbedded in a notch or depression in the lower lid just posterior to the free border of the latter, and that all around this depression there were numerous follicles. Removal of the cilia as a rule cures the trouble. It was a noteworthy fact that the lids in none of the cases presented any deviation from the normal position; in other words, there was no entropion. The author illustrates his communication with several drawings showing the different grades of the affection. The first grade seems to be characterized by simply a bending in of the cilia. The second grade is characterized by the presence in the posterior lid border of a shallow notch or furrow. The third grade is characterized by a marked deepening of this furrow with the appearance of granulations on its borders. The fourth grade is where the granulations have increased in size and number to such an extent as to touch and to transform the furrow into practically a canal which now incloses the ends of the cilia. Hirsch then enters into a discussion as to the etiology of this curious affection, and closes by advising the removal of the cilia through electrolysis as being the means which is most likely to bring about a cure.

Subconjunctival Injections of Acoïn.

Dr. G. Hirsch. (*Archiv für Augenheilkunde*, November 1900.) According to Hirsch's investigations, acoïn has no effect upon either the pupil, accommodation or upon the condition of the conjunctival blood vessels, facts which by the way, were shown by Randolph two years ago. (*Ophthalmic Record*, August, 1899.) When used for subconjunctival injection the author has never seen any toxic symptoms. The anesthesia is induced by a one per cent solution which is dropped into the eye, and one must wait for from one to five minutes before getting the full effect. The anesthesia is perfect and lasts longer than cocaine. It was found more effective than cocaine in such injections as hydrag. cyanatum and chloride of sodium. He generally drops in the solution a few moments before making the injection, and he adds also a small quantity to the injected solution. Otherwise the injection is

always painful. The author then cites a number of cases which illustrate and support his views.

Three Cases of Glaucoma Associated With Chronic Aural Catarrh.

Dr. R. Bijlsma of Middleburg, Holland. (*Zeitschrift für Augenheilkunde*, Dec., 1900.) Urbantschitsch, Rampoldi, Davidson and others have called attention to the connection existing between certain eye and ear affections. The author reports three cases in which chronic aural catarrh and glaucoma went hand in hand. The first case was that of a woman fifty-nine years old, who first consulted the author on account of tinnitus aurium. The diagnosis of chronic aural catarrh was easily made. About this time the patient complained of seeing the rainbow appearance about a lamp flame. The tension was found to be elevated in one eye, and possibly so in the other eye. The pupils were sluggish and slightly dilated. Both visual fields were narrowed, and especially the left, in the characteristic direction. The ophthalmoscope verified the diagnosis of glaucoma. The glaucomatous condition was dissipated by the use of miotics, and nine months later the condition could be regarded as stationary, while the subjective noises in the ears had disappeared. The second case was a man of fifty-eight, who complained of dizziness and subjective noises and some deafness. The diagnosis of chronic aural catarrh of the right ear was made in this case also. The eye at this time was normal. He was put on the regular treatment, but got no better, and one month later came back with increased deafness, pain in the right eye and with a vision in this eye of 6-12, and with the usual symptoms of chronic glaucoma. The patient was treated by instillations into the eye of pilocarpine and by hypodermatic injections of the same drug for the ear symptoms, and two months after this the eye trouble had disappeared and the ear trouble had also markedly improved. The last case was also a somewhat similar one, and was that of a man sixty-four years old, who had complained for some time of deafness and subjective noises in his right ear. Here also the diagnosis of chronic aural catarrh was made. The right eye showed subacute glaucoma, while the left eye was normal. One month later, under the same treatment as was pursued in case number 2 (i. e., catheterizations, pilocarpine injections and instillations), the patient's vision was restored and the subjective ear trouble had disappeared. The author thinks that in the first case the subjective noises depended upon the appearance of the glaucoma, while in the other two cases there

was only a presumption of a connection between the eye and ear trouble.

The Modified Open Treatment of Operative Wounds upon the Eyeball.

Dr. Ernst Heimann. (Münch. Med. Wochenschrift, 19 Februar, 1901.) The author's communication has of course reference to the well-known work of Hjort in this connection. His suggestions, however, are not so radical as those of the latter. He sets forth the advantages of the bandage, the chief of which are immobilising the eyeball, protection of the eye from outside influences of either a mechanical or bacterial character. The disadvantages are that the bandage exercises unequal pressure upon the eyeball and is frequently displaced. It brings about a stagnation of the secretion in the conjunctival sac, and by elevating the temperature at this point promotes the multiplication of bacteria. Physiological movement of the eyelid is abolished. Pressure is exercised upon the sclera and a tendency to gaping of the wound is produced, and finally the bandage is often responsible for marked psychic disturbances. Heimann suggests as a substitute for the bandage a shield such as has been devised by Fuchs, Praun and others, and which allows the eye to remain open and does not interfere in any way with the movement of the lid. Such is the modified open treatment, and for it he claims these advantages. Protection of the eye from mechanical injuries; it permits the removal of the bacteria from the conjunctival sac by the lid movement. The eye is sooner free of irritation, because there is no longer any stagnation of the conjunctival secretion. A better coaptation of the wound edges is made possible and less traumatic astigmatism results. It is less of a burden to the patient, and it is far less likely to give rise to psychic disturbances. This method, too, enables us to control more successfully the after treatment, inasmuch as we can inspect the eye.

The Effect of Increased Intraocular Tension Upon the Quantity of Blood in the Eye.

Dr. V. Grönholm. (Zeitschrift für Augenheilkunde, Januar, 1901.) The author discusses our present theories as regards the nature of glaucoma, and shows how both the retention theory and the blood stasis theory are inadequate to explain the occurrence of acute glaucoma. He also criticises the anatomical findings in glaucomatous eyes, and shows pretty conclusively that nothing positive, in so far as either theory is concerned, has been demonstrated. Inasmuch as the question of circulatory disturbance and the

changes in the quantity of blood in the eye is intimately associated with the pathogenesis of acute glaucoma, Grönholm has undertaken a series of experiments to determine the effect of intraocular tension upon the quantity of blood in the eye. His experiments were made on rabbits, and I need not describe in detail the technique. His experiments, it is true, only number five, but point to the probability that no increase in the quantity of blood in the eye occurs when the intraocular tension is elevated; on the contrary, the quantity of blood in the eye remained absolutely the same during the entire time in which increased intraocular tension lasted. In comparing with one another the blood quantity at the different injection pressures, it was found that the quantity of blood in the eye regularly diminished if the intraocular tension went up to 50 or to 75mm. Hg., and that the retinal vessels became narrower; but if a lower injection pressure was employed there was at one time a decrease and at another time an increase, and again there was no change at all in the blood quantity. The first evidence of an increase in the quantity of blood in the eye is generally the pressing or expulsion of blood from the eye. The experiments show then that when intraocular tension in the normal eye is increased there is no increase in the quantity of blood in the eye, that there is no stasis; on the contrary, there is a decrease—in other words, there is ischemia. We know that dilation of the ciliary veins in acute glaucoma is the rule, but this dilation cannot be due (according to the retention theory), to increased intraocular tension, but must be determined by other conditions which are as yet unknown.

On Gonorrhoeal Ophthalmia.

Greeff, Dr., R., Prof., Berlin, (Berl. Klin. Woch. 1901, No. 6, p. 181.) G. objects to the term blennorrhoea, which today comprises various affections. The bacteriological examination is very important for the diagnosis of gonorrhoeal conjunctivitis. If subjected to Gram's staining the gonococcus discolors, not other diplococci which, in their arrangement and morphology, are identical with gonococcus and are called pseudo-gonococci. Only in fourteen out of forty cases admitted as blennorrhoea neonatorum to the eye clinic at Breslau, Groenouw found gonococci. The gonococcus can penetrate the intact epithelium of the cornea, if it acts for a long time, i. e., only if the pus stagnates on the cornea. From the gonorrhoeal conjunctivitis, originating from contact, metastatic gonorrhoeal conjunctivitis has to be discriminated, which is rather frequent. It is a conjunctivitis

with oedema and frequently iritis, but not with profuse sup-
puration. Generally no gonococci was found in the secre-
tion. The iritis is plastic, analogous to the gonorrhoeal affect-
ions of the joints, and is apparently due to mixed infections. The
third form of gonorrhoeal affections of the eye is charac-
terized by metastases in the body, originating from the eye.
It almost always occurs in the newborn or in children in the
first few years of life. G. observed such a case: A boy,
four years old, apparently was infected by towels used by his
mother, who had purulent vaginal secretion. He was ad-
mitted to the Charité with gonorrhoeal conjunctivitis and
sloughing of cornea. Soon swelling of lids set in, with de-
struction of cornea and panophthalmitis, then high fever with
sanguinolent urine, in which gonococci were found. Since
the prepuce showed not the least irritation it may safely be
surmised that the gonorrhoea was descending, not ascend-
ing. These cases are very rare, but especially interesting.
As to Credé's method, G. thinks that a two per cent solution
of nitrate of silver is too strong for that purpose; it may pro-
duce suppuration, which may be taken for gonorrhoeal con-
junctivitis, and cause opacities of the cornea. A solution of
1:4000 destroys gonococci with certainty. Weaker solu-
tions penetrate more into the depth of the tissues, while
strong solutions prevent this by coagulating the surface.
Therefore G. proposes prophylactic instillations of one-
fourth per cent or .10 per cent solutions of nitrate of silver,
from which he saw much better results. For treatment ever-
ing and brushing the lids is not necessary, and may injure
the cornea. The lids are simply held apart and moved about
to evacuate the discharge, and to bring a weaker solu-
tion of nitrate of silver, which is dropped from a bottle, all
over the conjunctiva. This has to be repeated every hour in the
first few days, and can easily be learned by the mother or
nurse. The treatment of gonorrhoeal conjunctivitis in ad-
ults is not as promising. Also here the stagnation of pus
has to be carefully prevented. Two-thirds or one-half of
the cases ought to get well, while all cases of gonorrhoeal
conjunctivitis in the newborn must recover when treated
from the start.

Prevention of Blennorrhoea Neonatorum.

Zweifel, Prof. P. Leipzig. (Centralblatt für Gynae-
kologie, 1900, No. 51.) The general application of Credé's
method by midwives, advocated by Cohn, meets with grave
objections. The purpose of Z.'s paper is to investigate
which of these objections is irrevocable, which may be re-
pudiated, and what consequences may be drawn therefrom
as to the generalization of prophylactic instillations. Blen-

norrhoea neonatorum is a specific disease, like gonorrhoea, caused by the gonococcus, and never propagated otherwise than by contact. Even latent gonorrhoea of the mother may produce it. Z. is convinced that there is no more reliable prophylactic against the disease than Credé's method, but the irritation of the conjunctiva, occasionally observed after it, so far prevented its obligatory introduction. Therefore Z. tried to find a safe but non-irritative method in a drug, which, being a specific against gonococci, would be hard to dissolve in distilled water, so that a more concentrated solution than one per cent could not form by evaporation of water. After several experiments he found such a remedy in acetate of silver ($\text{Ag C}_2\text{H}_3\text{O}_2$), which keeps well in a dark bottle. From April 16, 1896, to June 30, 1900, this was used with eye-dropper in Z.'s clinic as a prophylactic, instead of nitrate of silver, on 5,222 children. $12=0.23\%$ acquired ophthalmoblennorrhoea (with gonococci), of very mild character, without damaging a single eye. Up to 1895 with 2% nitrate of silver 0.62% blennorrhoea occurred. Protargol was not satisfactory. To explain the argentum-catarrah, Z. washed with distilled water one eye of 816 children to remove the chloride of sodium of the conjunctival secretion before employing Credé's method. The other eye was left intact, but after instillation of nitrate of silver it was irrigated with a diluted solution of chloride of sodium. In the first eye a catarrah developed, the second remained free from irritation. In the newborn no discharge of tears takes place which contain 0.6 to 1% chloride of sodium. Therefore a catarrah easily occurs in the newborn, never in an adult after instillation of a 2% solution of nitrate of silver. Z. is of opinion that the prophylaxis against blennorrhoea can never be made obligatory and be enforced by law like vaccination. Oculists ought to report midwives (who in Germany superintend 95% of the confinements) if violating their duty in that respect to the health officer. Midwives ought to practice the prophylactic method only facultatively, i. e., (1) in granular colpititis, profuse leucorrhoea, condylomata, (2) if other children of the same woman had blennorrhoea neonatorum, (3) in all children of unclean people. As long as the relatives do not protest, the midwife ought to instill acetate of silver. If this is objected to she has to watch the eye with special attention, and in case the lids should agglutinate to enforce the employment of a physician, if possible, of an oculist.

C. Z.

Again: Protargol in Place of Credé's Method.

Englemann, Dr. F., Bonn. (Centralblatt für Gynaek., 1900.) One thousand children were treated with the

same good results as reported before (C. Bl. Gyn., 1899, No. 30). In about 80% no secretion at all, in 20% some secretion, but never as much as after nitrate of silver, which was used for comparison in a series of children. The bad results reported by Zweifel (reviewed by us in this number) are apparently due to inferior quality or disintegration of the protargol which takes place when prepared warm or boiled, or exposed to light or by contact with metals. The manufacturers now recommend that the physicians prepare the solution themselves or add on the prescription, "Frigide paratum."

Remarks on Scrophulosis and Tuberculosis With a Case of Tuberculosis of the Conjunctiva.

Uhthoff, Prof. W., Breslau. (Berlin Klinische Wochenschrift, 1900, No. 50.) Phlyctaenula is mostly found in scrophulous children of tuberculous heredity, but in a small percentage of cases no anmesic or objective signs of tuberculosis could be ascertained. Therefore the diagnosis of scrophulosis is not to be made simply from the presence of phlyctaenula, if not associated with other symptoms, since phlyctaenula is not a tuberculous affection, and the morbid agent of it has not yet been found. U. leaves the question undecided, whether in scrophulous individuals or in those charged with tuberculous heredity an infection of the intact conjunctiva is possible. Eighty per cent of U.'s patients, suffering from severe and frequently relapsing scrophulous ocular affections, reacted to tuberculin, and probably were tuberculous. How shall we treat swollen preauricular and submaxillary lymphatic glands? Are they a protection or even destroyers of the tuberculous virus as long as they do not suppurate, or are they to be removed? U. expresses his doubts as to these questions and appeals to the surgeons for an answer. The following case is reported: A young lady of tubercular heredity had extensive tuberculosis of the mucous membrane of nose, soft palate and epiglottis, apparently propagated through the lacrimal duct, causing dacriocystitis and lacrimal fistula. Infection of the conjunctiva starting at the inferior inner quadrant opposite the lower tear point as infiltration with tubercles and superficial ulcerations, with subsequent papillary and granular swelling of conjunctiva of upper lid. The latter was to be attributed either to the toxines of the tubercle bacilli, or the continuous irritation by the tubercular focus or to mixed infection. The same trachomatous aspect of the conjunctiva of the other eye was probably caused by the tuberculosis of the nose and lacrimal canal, without marked signs of dacriocystitis, and by the tuberculosis of the conjunctiva.

Eye Exercises in Connection With Gymnastics.

Ziegler, Captain, retired, Rummelsberg. (*Deutsche Med. Woch.*, 1901, No. 2, p. 29.) Object lessons, estimating distances and controlling them by walking, calling attention to rapidly appearing and disappearing pictures, by the teacher in gymnasium or in the fields are advocated to increase the usefulness and the function of the visual organ.

Hygiene of the Eye at the Commencement of the Twentieth Century.

Schmeichler, Dr. L., Bruenn. (*Beitr. zur. Aug.* Heft 46, 1901.) A hundred years ago nothing had been done in hygiene of the eye. The etiology of ocular affections was not known, or was based on wrong suppositions, and the classification of the former was only schematic. The author gives, on 160 pages, a review of the present state of the hygiene of the eye from ophthalmological and hygienic periodicals of the last ten years, with a few exceptions, and from the works of Perlia, Troussseau, Cohn, Magnus, Fuchs and Fick (reviewed by us in 1900, April number). In the hygiene of conjunctival affections S. enters closely into the bacteriological relations by describing the conjunctivitis caused by the bacillus Koch-Weeks, *Diplococcus Morax*, Axenfeld, and pneumococcus. Credé's method ought to be compulsory in order to yield its full beneficial action. The hygiene of trachoma requires teaching its dangers in school, church and by popular essays, educating the people to cleanliness and prevention of propagation to others, decentralization of the places of treatment by erection of more eye hospitals and ambulances, strict prophylaxis in army, school and other institutions. In the chapter on Myopia all the essential points as to architecture of school houses, seating, books, time of lessons and illumination are discussed. Welsbach's (Auer's) and electric incandescent light are considered the best, but, if possible, artificial light ought to be avoided in school. Injuries of the eye, affections from intense illumination, nystagmus of miners are treated in the third, and idiopathic hemeralopia in the fourth chapter. The miasmatic character of the latter is not accepted. Its successful treatment with boiled liver or cod liver oil (which in Russia is called "oil against blindness") is recognized almost by all authors. In the section on intoxicants S. thinks that for the prophylaxis of alcohol intoxication warning against excessive drinking will find more willing hearers, and therefore be more effectual than advocating total abstinence. Further are discussed intoxications by lead, sulfo-carbon, nitro-benzol, oxide of carbon and by drugs, as filix mas, quinine, phosphorus, morphine, cheese,

mushrooms, ergot. Chapter VI deals with heredity and consanguinity. Congenital defects may be inherited, as experimentally shown on animals, and may be propagated through several generations. Children may inherit anomalies of constitution which may bring about ocular affections, as scrophulosis and syphilis. A disposition to certain eye diseases like glaucoma, strabismus, color blindness, anomalies of refraction may be hereditary. Typical among these is the hereditary atrophy of the optic nerve developing between puberty and the twenty-fifth year, attacking chiefly the male members, while the females are the conductors of the disease. Consanguinity does not play such an important part as formerly supposed, but it certainly does if an ocular defect occurred in the progenitor. The author concludes with some general remarks on blindness. The work is very conscientiously written and gives an excellent sketch of the present state of ocular hygiene, so that we strongly recommend it to our readers.

The Hygiene of the Eye in the Nineteenth Century.

Cohn, Hermann, Prof., Breslau. (Berlin. Klin. Woch. 1901, No. 4.) Save a few remarks on what might be detrimental to the eye in the "Ophthalmuleia" (eye service) by George Batsch, which appeared 1583 at Dresden, nothing on hygiene can be found before 1800, when the excellent work of George Joseph Beer, "Care of Healthy and Weakened Eyes," was published at Vienna. This book of Beer is the foundation of all later works on hygiene of the eye. Half a century elapsed until Arlt wrote his popular monograph, "Care of the Eyes in Healthy and Morbid Conditions." Cohn's "Examinations of 10,060 School Children with Suggestions for the Improvement of Conditions in School Detrimental to the Eyes" (Leipzig, 1867) started an immense literature on school and eye hygiene.

In the chapter on illumination in school, C. mentions his "Lichtpruefer," photometer (1899.) It contains many very small figures, which must be read at a certain distance through three grey glasses. The more figures are correctly read aloud within one minute, the better is the illumination. By comparison with photometric measurements C. ascertained which illumination was excellent, good, useful and not sufficient, as was corroborated by Roemer. Luxfer-Prisms double or treble the light in dark school-rooms. Grey shades absorb 90 to 94% of light. C. recommends white or cream-colored curtains of fine muslin or Dowlas curtains, which absorb 40 to 50% of light. He also measured the value of illumination of lamp globes (Wiesbaden, 1885) and

found that a polished tin screen gives an intensity of illumination of fifteen meter candles at a horizontal distance of one-half meter from the flame; one of the same size, but painted white, only nine meter candles. Burgerstein's opinion is generally accepted, that pupils of seven to nine years should use their eyes for near work in school and at home for not more than three to four hours daily, of ten to fifteen years six hours, older ones at the highest—eight hours. An intermission of fifteen minutes between each lesson must take place.

Forty per cent of blindness is avoidable. The most important prophylaxis rests on repeated teaching of the rising generation in schools and universities and the public at large by popular lectures. The great achievements of ocular hygiene in the last century are summed up: Absolute prevention of variola of the eye, and of blennorrhoea, a series of prophylactic measures against the increasing myopia and effects of intense light, and the recognition of the importance of cleanliness with regard to contagious inflammations of the eye. When C. concludes with the remark that the names of Beer, Jenner, Fahrner, Leonard Weber and Credé will be celebrated yet in remote times as those of the pioneers in ocular hygiene during the nineteenth century, he modestly omitted his own name, which is closely and honorably connected with this branch of science.

Topography of the Lacrimal Gland and of Tubulo-Acinous Glands of the Eyelids of Man.

Hocevar, Dr. M., Laibach. (Wiener Med. Woch., 1900, Nos. 49 and 50.) Recent observations of E. Bock showed that the situation, form and size of the lacrimal gland in man frequently deviate from the doctrine so far in vogue. Therefore H. studied the topographic details of the lacrimal gland on microscopic sections of twenty eyes, and reached the following conclusions: The tissue of the lacrimal gland is found subcutaneously in the region of the external canthus, the upper and lower lids (also subconjunctivally) as far as the middle of the palpebral fissure. Aside of both the well-known chief portions of the lacrimal gland, the lobules form small groups, sometimes a continuous row at those places from the upper to the lower fornix. They are flattened and wedge-shaped, if imbedded in firm tissue, round or oval in loose tissue. They all have secretory ducts opening into the temporal sac of the conjunctiva. In addition to these, which vary from large masses to the smallest sizes H. found in the meshes of the connective tissue, at the same regions, elements of tubulo-acinous glands of very small dimensions, even isolated groups of single glandular

cells without ducts, which were scattered sterile elements separated from the matrix. These are encountered at all ages, but the extent of the tissue of the lacrimal gland in the child is smaller than in the adult. In almost half of the cases lobules of tubulo-acinous tissue were seen in the sub-conjunctival tissue, or, more frequently, in the tarsus itself, which lay close to the Meibomian glands or entered into their interior. Thus they assume a round kidney-shaped or polygonal form between the acini of the latter. The ducts of these always sharply defined glands end in the shallow recesses between the papillae of the conjunctiva. The histological structure and the topography bring these glands in the closest relation to the lacrimal gland, just as the tubulo-acinous glands of the mouth to the salivary glands.

Tenth Report on the Eye Department of the State Hospital at Laibach Krain, Austria, for the Year 1901.

Bock, Dr. Emil, surgeon in charge. 1150 eye patients. The diseases and 439 operations are enumerated in tabular form; 120 cataract operations, of which 65 flap extractions with iridectomy, 3 without; 24 iridectomies for glaucoma. The importance and the achievements of the department are illustrated by a table showing its continuous growth from 406 patients admitted, with 174 operations, in 1891, to 1089 newly admitted, and 430 operations in 1900.

A Contribution to Vaccine-Blepharitis.

Strerath, Franz, Inaug. Diss, Giessen, 1900. The 47 cases of vaccine-blepharitis so far published were collected by Schirmer. S. reports two cases from the eye clinic at Giessen. Case. 1. Girl, aged two years, showed an inflammation like a hordeolum three days after vaccination. Ten days later five vesicles of the size of a small pea, filled with pus, at the inner half of the right lower lid, and one at the left lower lid. The outer halves of upper and lower lids were the seat of diphtheric ulcers, which healed after eight days. The lashes all had fallen out, and had not grown when seen a year later. Case 2. Woman, aged 53, was infected by her grand child, which had been vaccinated. After eleven days both lids of left eye very much swollen and red; showed large diphtheric ulcers with blennorrhoeal discharge. The affection healed in four weeks, cornea a little hazy, the cilia of upper and lower lid completely missing. Indifferent treatment is the best, i. e., nothing but to keep the eye clean.

Report of Fifty-Two Myopia Operations.

Gehrhardt, H., Inaug. Diss., Giessen, 1899. From January 1, 1894, to April 1, 1899, Prof. Vossius performed fifty-two Myopia operations on forty-three patients, with good results. One eye was lost by infection, another by detachment of retina five months after operation, which was complicated by prolapse of vitreous. Most patients were between sixteen and thirty years old. The degree of M. ranged from 10 to 30 D. Complications: Staphyloma posticum, 50; changes at macula, 23; opacities of cornea, 10; of lens, 11; of vitreous, 12; choroiditis, 5; astigmatism, 11. $V=0.01-0.1$ in 17 eyes, $0.15-0.2$ in 14, $0.25-0.3$ in 16, $0.35-0.5$ in 5. Eyes with least V. had the smallest percentage of staphyloma posticum, but the highest of opacities of the cornea. 86 discissions, 16 punctures, 32 extractions, 4 iridectomies were performed on the 52 eyes. In most eyes, i. e., in 32%, one discission and a simple extraction were necessary; in 17.3% two discissions and an extraction. Secondary cataract was operated upon latter if it diminished V. too much. Opacities of cornea were sometimes observed by lens matter touching and thus damaging the epithelium of Descemet's membrane, as experimentally shown by Schmidt-Rimpler. Flap extraction by section in the sclero-corneal junction in 8 cases, when Vossius was convinced that the zonula was not defective and the vitreous not liquified. The operation improved V. $1\frac{1}{2}$ to 2 times in 30 eyes, $2\frac{1}{2}$ to 3 times in 10, 4 to 5 times in 3, 10 times in 1, apparently not in 5. Emmetropia resulted in 7 eyes, hypermetropia in 34, myopia in 8, not definite in 3. Also a short resumé of the results of other authors is given.

Report on 337 Cases of Enucleation and 78 Cases of Exenteration of the Globe.

Minrath, Jacob, Inaug. Giessen, 1900. The report comprises the enucleations and exenterations performed by Prof. Vossius from 1879 to 1900, for the following diseases. Severe injuries, 30 en.; 28 ex.; iridocyclitis, without symp., 47-2; with symp., 20-1; phthisis bulbi, 91-3; panophthalmitis, 25-13; abscess of vitreous, 36-19; abscess with symp., 3-2; traumatic hemophthalmus, 4-3; absolute glaucoma, 2-0; secondary glaucoma, 14-0; staphyloma corneae, 22-6; tumors, etc., 43-0. No complications through the operations. Two cases of enucleation in sympathetic ophthalmia came too late. One death occurred after exenteration in chloroform narcosis in a case of fatty degeneration of the heart, and one after enucleation in a case of hypertrophy of left ventricle and Bright's disease. In abscesses of vitreous, recent severe

injuries and panophthalmitis, exenteration has considerably replaced enucleation; also in commencing staphyloma of cornea, whereas in fully developed staphyloma, buphthalmus, sympathetic ophthalmia and intraocular tumors enucleation has to be performed.

Contributions to the Pathology and Therapy of Disseminated Choriorretinitis.

Pruemm, Joh., Inaug. Diss., Giessen, 1900. The clinical histories of 100 cases of disseminated choriorretinitis are reported, out of 14,500 patients admitted to the eye clinic at Giessen, from April, 1879, to December, 1899, i. e., 0.69%, 57 men, 43 women. In most cases it developed at the age of puberty, in 7 only one eye was affected. The usual complaints were observed, some patients did not notice any. One-third of the cases showed complications: Opacities of cornea, 12; remnants of iritis, 6; opacities of lens, 5; of vitreous, 9; hemorrhages of vitreous, 1; detachment of retina, 3; optic neuritis, 4; hyperemia of disk, 11; atrophy of optic nerve, 1. The latter affection occurred only in the later stages of the disease, but even in these V. was not so much reduced that total blindness ensued.

One case was complicated with retinitis proliferans, two with retinal hemorrhages. According to Leber the same *causa peccans* produces different affections of the retina and choroid in such cases, according to the difference of the vascular systems of both membranes. The retinal arteries are terminal arteries, and aggregations of microbes, entering them, may here lead to infarctions and hemorrhages, in the choroid to embolism and inflammations. The etiology remained obscure in many cases. Lues could be distinctly surmised in seven, with great probability in ten. Chlorosis was observed in 14, anomalies of menstruation sixteen, puerperium two, diminished lactation one, scrofulosis twelve, measles and scarlet fever ten, typhoid one, articular rheumatism four, effect of intense light two. The dependence of retino-choroiditis on some of these affections may be due to autointoxication. Myopia was found in twenty-six cases, emmetropia and hypermetropia in seventy-six. In twenty-six nothing could be revealed as to etiology. Subconjunctival injections of one Ccm of Na Cl solutions, 4 to 10% proved partly beneficial. Injections of smaller quantities are of no avail. In many cases V was improved, flashing and other complaints disappeared, opacities of vitreous cleared up, but mostly only temporarily. Frequently relapses, with considerable diminution of V, occurred. Generally the course was slow, the patients had to give up work only tem-

porarily and could earn their livelihood until complications set in.

Contribution of the Causatives of Thrombosis of the Central Retinal Vein.

Schoenwald, Otto, (Inaug. Diss. Giessen 1900.) S. reports 18 cases of thrombosis of the central retinal vein observed at the eye clinic at Giessen from 1890 to 1900. The age varied from 39 to 79, but chiefly from 50 to 70. Arteriosclerosis was apparent in seven cases, affection of the heart in three, emphysema of lungs in two, albuminuria in a few, diabetes in two. Most of them had rheumatism, none syphilis. Thrombosis occurred almost always suddenly; impairment of sight was noticed accidentally. In three women it commenced at the onset of menstruation. In one man it was caused by fracture of the external orbital wall and compression of the cavernous sinus by the fragments, and in another it followed contusion of the globe four weeks later. Secondary glaucoma developed in four cases. Two patients died of apoplexy shortly after the onset of thrombosis, one had an apoplectic stroke one year, another several years before the ocular affection. The author calls attention to the fact that thrombosis of the retinal vein may be a precursor of fatal apoplexy and therefore of prognostic value. The ophthalmoscopic condition corresponded to the observations of Von Michel. Arteriosclerosis of the retinal arteries could be seen with the ophthalmoscope in nine cases, in one at the fundus of the other eye, and another showed sclerotic processes of the choroidal vessels.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY CHARLES A. OLIVER, A. M., M. D.,

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ASSISTED BY

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(QUARTER ENDING MARCH 31, 1901.)

Desk and Chair for the Prevention of Myopia.

Rolland, Toulouse. (Le Bulletin d'Oculistique, February, 1901.) At a recent meeting of the Academy of Paris, Panas gave a description of a desk and chair designed by Rolland for the prevention and hygienic treatment of myopia. The principal features of the arrangement are a hinged top to the desk which may be inclined at a correct angle; a horizontal bar suspended by two uprights at the position the scholar's forehead should occupy, and which prevents him from approaching too closely to his work; and a movable foot-rest and a brace to retain the chair at its proper position in front of and facing the contrivance.

Fracture of the Orbit.

Moty. (Bulletin de la Société Centrale de Médecine du Département du Nord, January 25, 1901.) The patient seen by Moty suffered from a compound comminuted fracture of the lower portion of the right orbit. The wound was freely opened and many spicules of bone were removed. The rough edges were trimmed off. Recovery was uneven and painful, but after the patient commenced going about again he noticed a fissure situated at about the position of the infraorbital foramen. He experienced considerable pain in this locality, this being augmented by cold winds or by pressure on the superior premolar tooth of the same side. Percussion of this tooth gave a different sound from that elicited from its opposite fellow. The fissure, Moty thinks, was undoubtedly the remains of an undetected fracture produced

the same time of the original accident. He believes that the traumatism probably terminated inferiorly in the spongy tissue of the alveolus.

Researches Into the Examination of the Fields of Vision, With Objects of Small Visual Angles. The Value of Such an Examination in Glaucoma.

Meisling, Copenhagen. (*Annales d'Oculistique*, December, 1900.) In his experiments, Meisling employed a campimeter which was quite similar with that of Masselon's. Care was taken, however, to have the color-tests of nearly the same color as the background so that they could be seen only in certain positions, thus preventing the patient from knowing just where he first saw the object. The test-objects varied in size from three millimeters in diameter up. The visual angle was further modified by the distance chosen between the patient and the screen. For the smallest card this distance was not made greater than one meter. The record thus made is to be marked so as to express the diameter of the object and the distance employed. A great number of contractions and scotomata which would be completely overlooked by the ordinary method of work can be thus readily detected. The author's findings correspond with those published by Bjerrum. In glaucoma he found that Marriotte's spot usually lies between the active and the non-active portions of the retina. He also frequently found a scotoma which extends from this spot as an arc going either above or below the point of fixation.

Technique of Electrolysis of the Lacrimal Canals.

Lagrange, Bordeaux. (*Annales d'Oculistique*, December, 1900.) Three things, says Lagrange, are essential for this character of work. 1. A sound that is protected throughout most of its length with an exposed conductor at the tip; an aperiodic galvanometer and a rheostat. The canal is to be cleansed first with an antiseptic solution and the punctum dilated. The sound is then passed and the current is very slowly turned on until it reaches a proper strength and is then connected with the negative pole. A wad of cotton is fastened to the positive pole and placed in the patient's nose on the same side as the sound. The current is then slowly turned on until a strength of five milliamperes is reached. This is continued for a period of five minutes after which the current is slowly turned off. During the procedure the wire should not be allowed to cross and the tampon in the nose must be immovably held. After the sound is withdrawn the canal is again cleansed with an antiseptic solution. For a brief period of time the irrigation is to be repeated

every other day. Frequently one application of the electricity is sufficient, but if necessary, the operation may be repeated several times.

Orbital Meningocele.

Lagleyze, Buenos Ayres. (*Archives d'Ophtalmologie*, December, 1900.) Lagleyze adds a description of one case of this affection to the brief list already in existence. The patient was an Italian girl of twenty-one years of age, who had become so disfigured by the growth and its surrounding hyperplastic tissue that it was impossible for her to obtain work. Almost the entire right side of her face was involved in the enlargement. The swelling in the orbital region was about one-half the size of an ordinary orange. The lids were immovable, and there was a marked ptosis. The exophthalmus was so pronounced that the eye protruded beyond the edge of the rim of the orbit, but upon separating the eyelids, the condition of the eye was found to be good. The iris reacted but slowly to light. The vertical movements of the globe had disappeared, while the horizontal ones were much limited. The edges of the optic nerve were indistinct and the retinal veins were dilated. The vision of the eye equalled about one-fourth of normal. Pressure on the eyeball reduced the exophthalmus to some extent. At the same time the size of the growth increased. There was no fluctuation or pulsation.

The patient stated that she was born with a small teat-shaped projection extending from the external angle of the right eye. The lids commenced to swell when she was quite young. There were never any attacks of inflammation. About eighteen months previous to her visit to the author, an operation had been attempted for the removal of the tumor, but the surgeons were forced to close the wound on account of violent hemorrhage. From that time the size of the growth had rapidly increased. Lagleyze decided to operate and after careful sterilization and with the patient anaesthetized, he introduced the needle of a Pravaz syringe and drew off a transparent liquid. A hasty examination of this with the microscope proved negative. An incision was made and the cyst was opened. On introducing a finger, a large cavity was found. This communicated with the meningeal sac by means of a hole in the vault of the orbit about a centimeter's distance from the orbital ridge. Through this opening the pulsations of the brain could be felt. The withdrawal of the examining finger was followed by gush of blood. A tampon was introduced and the cutaneous wound was sutured. Two months later a second operation was decided upon. The ends in view were to render the patient's

life safer and to lessen the deformity. It was considered inadvisable to attack the tumor cyst itself. As the eye was useless it was enucleated and a large portion of both the upper and the lower lids with much of the hyperplastic tissue was removed. The edges of the lids were brought together and the orbit was closed.

At the present time the skin over the meningocele shows some pulsation, but the author still hopes that the operations he performed will prove to be a success insofar as was expected.

Opticociliary Resection In Cases of Absolute Glaucoma.

Fage, Amiens. (Archives d'Ophtalmologie, December, 1900.) Fage pleads for a wider recognition of the operation. He claims that its practical results justify this conclusion. Relief, he says, is obtained through opening the sheath of the nerve and thus favoring the emptying of the perichorioidean space by means of the communicating channels with a lessening or stoppage of the secretion of aqueous humor owing to a destruction of the ciliary nerves. During the operation he cuts the internal rectus in order to have sufficient room to work.

Blepharoplasty, Description of a New Microbe In a Case of Malignant Pustule.

Gabrielides, Constantinople. (Archives d'Ophtalmologie, December, 1900.) Gabrielides describes in detail several blepharoplasties which he had performed for the most part for the correction of contractions following malignant pustule. One case of this disease studied by him, he says demands attention, owing to an apparently new form of microbe found in the lesion. This was a coccobacillus that colored more freely at the rounded ends than at other portions, and which did not take the Gram's stain. Cultures on agar agar grew rapidly at a temperature of twenty-two degrees C., and thirty-six degrees C. In less than twenty-four hours' time roundish, yellowish, white colonies of about two and a half millimeters in diameter each were formed. These were prominent in the center, odorless and seemed quite dense. They liquified coagulated serum and gelatine in twenty-four hours' time. In forty-eight hours' time when placed in fermented lactose at a temperature of 37 degrees C. they did not liquify the mass, did not coagulate milk, and grew in a supposed vacuum. A culture in bouillon grew abundantly and in thirty-six hours was covered with a white veil. Two drops of a solution made by mixing a small colony in a cubic centimeter of bouillon, when injected under the skin of the abdomen of a guinea pig caused the death of the

animal in twenty-one hours. Besides this cocco-bacillus there were present certain large cocci (larger than the staphylococcus) which took the Gram stain rapidly. The cocci were also found in a culture made from a dirty dressing which covered the lesion at the time the patient entered the hospital.

Optic Neuritis Following the Absorption of Thyroidine.

Coppez, Brussels. (Archives d'Ophtalmologie, December, 1900.) Five cases of optic neuritis following the excessive ingestion of thyroidine have come under Coppez's notice. Four were seen in women and one in a man. The disease he finds is of the retrobulbar type giving rise to a central scotoma. The treatment is practically the same as is used in retrobulbar neuritis cases. The drug was taken in some preparations intended for the relief of obesity.

TRANSLATION ITALIAN OPHTHALMIC LITER- ATURE.*

By CASEY A. WOOD, M. D.,

CHICAGO, ILL.

(QUARTER ENDING MARCH 31, 1901.)

Movements of the Eyeballs in Persons Seeing for the First Time.*

By Edmondo Trombetta, M. D., Florence, Italy. Surgeon
at the Scuola d'Applicazione di Sanità Militare.

Professor Guaita recently had occasion to operate at the Ophthalmic Clinic at Florence, on a girl ten years of age, with congenital cataract in both eyes. The results of the operation were brilliantly successful and the case afforded me an opportunity to experiment a second time and apply my method of educating the sense of sight. In my first attempt, made three years ago, in Professor Reymond's Clinic, I succeeded, after forty-five lessons, not only in teaching the child to see without the aid of the sense of touch, but in obtaining satisfactory binocular vision and considerable visual acuity.

I will not repeat here the ideas presented at length in my preceding communication** on the subject, published in the Clinica Moderna, Nos. 17 and 30, 1898, in respect to the gradual substitution of binocular for "simultaneous" vision. The latter exists alone, I am convinced, not only during the first period of life, but also for a time after operations for congenital cataract. I will also refrain from describing the successive phases through which the patient was guided in the course of the training that I imposed upon her. I will confine myself to the principal points on which stress must be laid to attain the desired end, and in the same order as observed in my first case, so that the variations from my procedure in the latter will be more readily apparent for comparison. The first step is to develop the faculty of attention which, in children in general, and especially in those seeing

*A full translation of the writer's article in the *Annali di Ottologia*, p. 17, 1901 m. *Saggio di educazione visiva negli operati di cataratta congenita.*

for the first time, is quite rudimentary. 2. To establish the association between tactile and visual sensations. 3. To obtain the gradual substitution of the visual for tactile sensations. 4. To train the associated movements of the eyeballs during and contemporaneously with the development of the new sense, and most important of all, to arouse the retinal reflex of convergence with which binocular vision is so intimately connected. As anticipated, the greatest difficulty encountered in the first lessons was to awaken in my little patient the faculty of attention through the organ of sight. As the psychic phenomenon of attention is directly connected with the physiologic phenomenon of convergence, it is, in my opinion, impossible to obtain the former without inducing the latter. Others before me have already observed that even the mere mental image of a near or distant object is able to modify temporarily the size of the pupil. I supplement this with the assertion that an abstract idea frequently affects the eye and exerts the same influence on the vision as a distant object with indistinct outlines, i. e., parallelism of the lines of sight, or "gazing at vacancy" to use the popular term. On the other hand, the mnemonic image that reproduces a concrete idea as of a person, object, etc., exerts the same action on the eye as the fixation of an object near at hand, i. e., convergence. These facts demonstrate the close bonds between the psychic phenomenon of attention and the physiologic phenomenon of convergence. In fact—to return to my little patient—it was as impossible to obtain even a trace of incipient attention as to succeed in my efforts to obtain convergence in the lines of fixation. This was due on the psychic side to the incoordination of the images represented, owing to the confusion produced by the first confused visual sensations, occurring in rapid succession with no control on the part of the centers of association. On the physiologic side, it was due to the oculomotor incoordination, which ranged from the most atypical and dissociated excursions to oscillating nystagmus, most active during futile attempts at convergence. It was only after long and patient efforts that I succeeded in rousing in the child the faculty of attention, which I then tried to maintain every time by resorting to the stratagem of making her fix a near object.

I obtained in this case, more rapidly than in my first, the association between tactile and visual sensations, and then the successive and gradual substitution of the latter for the former—for reasons to be explained later. In other respects this case and the various phases of the educating process did not differ materially from my first case. The success attained realized my anticipations and demonstrated once

more, that this method of training the eye not only restores complete function to the organ of sight, but calls into being more exalted functions, and thus solves one of the most complex physiologic problems under the modest guise of simple ocular gymnastics. My attention in this case was principally attracted to the movements of the eyes. I based certain researches on them which I will only outline here, as I intend to describe them more fully in a later work. Examining the child a few days after the last protecting bandage had been discarded, I noticed that the movements of the eyeballs were irregular, atypical and occasionally dissociated, to such an extent as to suggest actual ocular ataxia. The only associated movements were: O. D: rotation outwards and upwards; O. S: rotation inwards and upwards, and U. O: rotation upwards.

Lively oscillating nystagmus appeared when the limits of these excursions were reached. There was not the slightest tendency to converge and consequently the fixation of objects was impossible. When I placed a shining article in front of the child and told her to look at it, a mirror, ring or tumbler, usually one line of vision would be directed on the object while the other deviated outward and upward, and whenever her attention wandered, the eyeballs would show movements in all directions the first associated movements, just mentioned, being followed by pronounced, bilateral, horizontal nystagmus.

This incoordination of the movements of the eyeballs, the ataxia of the globes, instead of surprising me merely served to confirm my conception deduced from previous experiences and observations of the manner in which vision develops at first in persons seeing for the first time after operations for cataract. This conception harmonizes with Preyer's assumptions in regard to the mode of development of the sense of sight during the first months of life. If, in fact, the associated movements of the two eyes combine for the task of seeing a simple object, it is evident that the lack of association indicates that binocular vision has not been established, and vice versa, if the vision is not binocular, then we can always calculate upon the existence of some disturbance in the sphere of the ocular movements. Moreover, as there was no diplopia in my case, and as in preceding seances the existence of pure, simple, monocular vision had been excluded, the facts observed afforded conclusive evidence in support of my assumption from a priori reasoning, namely, that in my case and in others similar to it, "simultaneous" vision exists and does not yield the field to binocular vision until the retinic reflex of convergence is aroused. Hence the problem

of the education of the visual sense presented itself to me under a new but no less important aspect, that is, of a kind of kinesitherapy (movement treatment), the aim of which is to develop by repeated stimulation, the retinal reflex of convergence, from which I anticipated—as proved to be the case—the definite establishment of binocular vision.

Aiming to obtain convergence of the lines of vision it was evident that the last portion of my training process must be merely another link in the same chain. If I could succeed in inducing at the same time both convergence and the faculty of attention, I might by this means arouse the reflex of convergence, and binocular vision would be established once and for all, and with this would vanish all the irregularities in the movement of the eyeballs. And thus it happened. In the course of the twenty-fifth seance I discovered that the child's vision had become stereoscopic, with normal convergence of the lines of vision on the object fixed, with no further irregularities in the movement of the eyeballs and no tendency to nystagmic oscillations.

From that day forward I also noted the interesting fact that the progress of the development of the sense of sight was incomparably more rapid than in the preceding sittings. Up to that time I had limited my efforts to naming articles and educating her conceptions of space and shape. After this I passed on without much trouble to teach her to differentiate two or more small objects without the aid of touch, thus initiating the second stage of the educating process, in which I aimed to substitute visual for tactile sensations and thus break the old chain of habits contracted from infancy. My little patient, even after the operation, was involuntarily impelled to recognize objects by the sense of touch, without realizing that a new sense had been born in her, and that floods of light were conveying new sensations to her brain.

As already noted in the case of my first patient, this was one of the most serious obstacles to be overcome in the application of my method of educating the sight. When the child was told to look at an object, name and describe it, she at once put out her hand for it and turned her head slightly backward and to the side, in that special attitude which I have observed to be invariable with blind people. I attribute it to the necessity they experience for directing the ear in the direction where it will catch the sound waves most perfectly in order to combine acoustic with tactile sensations, not only for the purpose of general orientation, but for the special differentiation of the object. Watching her eyeballs under these circumstances, I suddenly noted a tran-

sient incoordination of the associated movements and brief oscillating nystagmus, as if the sense of sight effaced once more, the little patient had returned at one bound to the period preceding the operation when her eyes had been accustomed to an infinitesimal amount of light, and rolled around in every direction seeking for it, while her hands, skilled to the task, grasped the object and explored its outlines. By means of patient exercise, however, in which I was ably assisted by my colleagues in the clinic, I succeeded in overcoming this difficulty and in the course of ten more lessons, the tactile sensations yielded the field almost entirely to the visual. They also assisted in overcoming the diffidence experienced by every person who sees for the first time, and distrusts the images furnished by the sense just awakened to life. An extremely significant fact, in my opinion, was the nystagmic oscillations of the eyeballs in the associated lateral excursions and also in the attempts at convergence. This nystagmus was very active at first, but gradually diminished in rapidity and frequency until it finally ceased completely. I will not repeat nor even summarize here the conclusions of my researches and experiences with nystagmus which I published in *Clinica Moderna*, Nos. 31 to 35, 1900, and supplemented in a communication read before the Turin Academy of Medicine December 7, 1900, but I cannot refrain from mentioning that this new case confirms previous assumption that congenital nystagmus is the result of an oculomotor incoordination, dependent upon some disturbance in the functioning of neurons from which a constant reflex excitation proceeds in normal conditions, that maintain the ocular muscles in a state of tonic innervation. When, after prolonged and patient exercises the little girl was able to use her organ of sight in a sufficiently satisfactory manner, and when in consequence, her orientation, at first defective, had become completed by the development of the ocular sense of space, harmony was established between the centrifugal routes of the coordinating centers—represented by the ocular nerves—and the centripetal routes—represented by the nerves of the vestibule and their terminations in the labyrinth. In other words, the nystagmus was abolished and coordination of the movements of the eyeballs was obtained contemporaneously with that higher cerebral function, the fusion of the images.

To recapitulate: The education of persons seeing for the first time should be directed: 1, to develop the faculty of attention; 2, to arouse the retinal reflex of convergence; 3, to obtain the substitution of binocular for "simultaneous" vision; 4, to educate the ocular sense of space, which repre-

sents a new and essential element in orientation; 5, to associate the tactile with visual images, and 6, to induce the gradual substitution of visual for tactile images.

In conclusion I wish to emphasize the first point, relating to the faculty of attention. In this respect the course of my second experience was almost the direct reverse of my experience in the case I observed and published in 1898. I must confess that the success obtained by the latest method of procedure was equally as good as with the first, while the time required was materially less than in my first attempt to educate the sight.

ABSTRACTS FROM SPANISH AND PORTUGUESE OPHTHALMIC LITERATURE,

BY ALBERT B. HALE, M. D.,

CHICAGO.

(QUARTER ENDING MARCH 31ST, 1901.)

Dilatation of the Ophthalmic Vein.

Diaz, C. P., Ortega, (*Gazeta Medica*, August 1, 1899), describes the results of an acute dilatation of the ophthalmic vein in a woman 32 years old of relative sound health, following grippe; the disturbance manifested itself first by noises in the left ear; shortly after the vision of the eye became dim and there were signs of injection and pressure (exophthalmia). Pain soon became intense and an abscess was suspected, but an exploratory incision showed nothing. Eneucleation was finally carried out, revealing a noticeably dilated vein which bled viciously, but finally yielded to pressure, continued for several days, when all symptoms disappeared.

Strabismus Treated by Means of the Stereoscope.

Presas, Barcelona, (*Revista de Ciencias Medicas*, June 10, 1900), analyzes the causes of concomitant squint, following Landolt, but thinks much more ought to be done than to depend entirely upon correction of refractive errors and surgery. He has made a collection of the various charts to be used in the stereoscope, and a fault he finds in most of them, especially letters) is that they can be so easily memorized, and that they, therefore fail to stimulate the curiosity or imagination. The author finally published a series of cards (diagrams) of his own device, wherein he thinks these dangers are avoided. There are thirty-three cards, no two alike, in which he uses geometric figures, introducing colors, normal and complementary, with devices for stimulating positive and negative images. In this way combinations can be made at random and capriciously. (His example for use cannot be given without the illustrations.) He insists on not trying any one combination until the preceding one has been completely removed and obliterated from the retina; and that the exercise should not extend above fifteen minutes. The article concludes with a description and direction for use of each of the thirty-three cards.

Treatment of Strabismus by Advancement.

Following immediately after the article on the stereoscope, comes (in *Revista de Ciencias Medicas de Barcelona*, Spain, July 10, 1900), another disciple of Landolt to express his enthusiasm for the newer method (advancement) in the operative treatment of squint, and its more logical indication compared with the older tenotomy. He considers orthoptic and stereoscopic treatment aids to nature, while he calls surgical intervention co-aids, and this he would apply to many cases of strabismus, paresis and paralysis. He holds that one muscle is weak and needs strengthening, not that the other should be weakened accordingly. A complete description of the operation as practical by Landolt is given, special stress being laid upon this technique, as in this way only, it is asserted, can the best results be obtained. A binocular bandage is applied in all cases for six or seven days in convergent squint, but in divergent squint only long enough to assure the healing of the wound. It is claimed that in advancement the excursion of the advanced muscle is increased, that of the antagonist not diminished; a great contrast to the effect of tenotomy. Again, the sinking in of the caruncle produced by tenotomy, is avoided, and the bulb is held back in its place—a decided advantage. In tenotomy, the first effect is the most striking, but may afterwards become neutralized or excessive, while in advancement, though the first effect may be disappointing, the improvement in time is marked, pleasing and permanent.

In paralytic squint no operation is really advisable, although good results may sometimes be obtained if the muscle functionates at all, either by operating on this muscle, or by attacking the muscle of the other eye so as to obviate the diplopia.

Advancement has one drawback—the muscle may be lost through failure to adhere to its new insertion, but this is very infrequently the case if the technique is properly observed. To reestablish binocular vision is the main motive of muscle operation—this is best obtained by advancement; the author confesses that a few cases may be benefited by tenotomy, but only on particular indications, never as a matter of choice.

Electrolysis in Entropion.

Luis Cirera (*Revista de Ciencias Medicas*, July 10, 1900) reports a case of facial paralysis (acute) treated by electricity in the usual way. This was on the left side. When cured, however, there returned a condition that had been noticed some time before the paralysis; i. e., a conjunctivitis, produced by inversion of the lashes at the external third of the

lower lid. No treatment has hitherto been of avail. Cirera, therefore, decided to try electrolysis by introducing a needle with the negative pole, two millimeters below the ciliary border, through the skin about one centimeter parallel to it. The positive pole was at the neck. A current of six milliamperes was passed for five minutes. This caused a subdermal cicatrix which everted the lid enough to remove the irrigation (after several treatments.)

This method has since been tried many times with gratifying success, and the author is inclined to believe that if properly carried out it will apply to all cases, although from time to time it may be necessary to repeat the treatment, as the cicatrix may soften or become dissolved.

ABSTRACTS FROM RUSSIAN AND SCANDINAVIAN OPHTHALMIC LITERATURE.

BY A. BARKAN, M. D.,

SAN FRANCISCO, CAL.,

AND

PROF. DR. A. KRUKOW, .

MOSCOW, RUSSIA.

(QUARTER ENDING MARCH 31ST, 1901.)

Musculus Dilator Pupillae.

John Widmark on Musculus Dilator Pupillae. (Hygein, May, 1900.) Has examined 5 freshly enucleated eyes microscopically. In 3 of the 5 he found the posterior epithelium in 2 layers. Henle's stratum showed the conditions of microscopical characteristics of smooth, muscular tissue. At times the author could follow up the muscle for a little ways into the ciliary body. C. F. Heefordt. Bericht der Augenhkde des Jensen, Copenhagen, 1900.) This interesting dissertation which has appeared in Copenhagen embodies the results of the author's work on calf, rabbit and human eyes, including embryological examination of the human foetus. The result he arrives at is that the M. D. P. consists of a continuous simple layer of muscular cells, which embryologically correspond with the interior retinal layer. The dilator cell consists of a contractor fiber and an epithelial part containing nucleus. All contractile fibers join the stroma of the iris anteriorly and form the contractile layer described as Bruch's membrane. The cellular elements containing a nucleus are situated posteriorly and form a part of the posterior epithelial lining of the iris.

On Local Treatment of Scleritis.

E. Jensen, (ibidem.) Subconjunctival injection of sodium salicylate gave no good results, and ichthyol salve, 1 - 10 gave better results. His best results were achieved with the Paquelin cautery. In two cases the success was surprisingly good, and in two others there was also a favorable result on

the course of the disease. The author has never observed an unfavorable reaction.

Bactericidal Effect of Tears.

A. Helleberg, (*ibidem*) Bactericidal Effect of Tears.

In order to decide whether tears had true antiseptic properties, or whether they formed merely an unfavorable culture medium, he prepared equal quantities of distilled water and tears with a few drops of bouillon. He found that the Staph. Pyogenes increased markedly in the bouillon water, but died very quickly in the tear bouillon.

Boiling for four or five minutes destroyed the antiseptic effect of tears. A sodium chloride solution of 1 to 1.5% did not prevent an abundant increase of the bacteria. The antiseptic properties of this do not depend, therefore, on the percentage of salt.

According to his views, then, tears exert a bactericidal effect on the Staph. Pyogen. Boiled water used for control experiments does not.

The bactericidal qualities are stronger the smaller the number of infectious bacteria.

Fresh virulent cultures offer more resistance than old ones. The bactericide agent is destroyed by boiling for four or five minutes. It is therefore a volatile substance, or it is precipitated in an inefficient condition with the voluminous albuminoid precipitates caused by the boiling of the tears.

The salts do not play the deciding part in regard to the antiseptic qualities of the tears.

Simple and Combined Extraction.

J. Silfvast, (aus Ophthalmol Klinick zu Helsingfors, April, 1900.) Good results in 80% of first and 70% of the latter. In his opinion the first method is more frequently applicable. His most important contraindications in simple extraction are glaucoma, narrow and unyielding pupil, and luxation of the lens if the iris cannot be completely replaced; whenever the iris can be placed in normal position, but does not become round, showing inclination to prolapse; when narcosis is necessary; cough.

Investigations Concerning the Specific Gravity of the Aqueous Humor.

Golowin, Dr. S. S., (v. Graefe's Arch. für Ophth., XLIX, 2.) The author uses in his experiments a peculiarly constructed pycrometer, which he had made in different sizes.

The normal specific gravity is approximately constant in

the eyes of animals of different kinds and in the human eye; for example, the specific gravity of the aqueous humor of the dog, expressed arithmetically, is 1.0086; of the rabbit, 1.0087; of the cat, 1.0088.

Aqueous humor, one of the lightest fluids of the animal organism, has specific gravity of NaCl solution, with salt content of somewhat more than 1%. In fact, it has approximately such a per cent content as a constituent part.

Aqueous humor which collects after anterior chamber has been emptied has noticeably higher specific gravity than the normal, but after 24 to 48 hours, concentration returns to normal.

Osmosis of 5% salt solution from the conjunctival sac effects an increase in gravity only when the corneal epithelium is removed. Injection of same solution into the subconjunctival tissue effects no change.

In acute inflammatory glaucoma the specific gravity is considerably increased; while in chronic glaucoma, which progresses without perceptible change in the anterior chamber, the normal weight is sustained.

Alterations of Astigmatism Under Certain Physiological and Physical Influences.

Botwinnik, Dr., (Arch. f. Augenheil K., XXXIX, 4.) The cornea readily changes its curvature under various, often slight, external influences, such as contraction of the orbicularis by blinking, by drawing the lid out, by pressure upon the eyeball, etc. By this changing of the corneal curvature astigmatism, even when pronounced, can be brought to complete correction of hypercorrection.

Blinking flattens the cornea particularly in the vertical meridian, and assists in self-correction of astigmatism in that plane, and also of myopia.

Drawing out the lids causes horizontal flattening and increase in the vertical curvature, thus tending to correct astigmatism against the rule.

Direct pressure upon the eye acts in the opposite direction and is, if a peculiar, at least a practical means for the correction of ordinary astigmatism.

The power of the accommodative mechanism to produce a lens astigmatism of from 0.5 to 2.5 D. contrary to the corneal astigmatism is an important factor in the self-correction of the latter. This accommodative astigmatism is produced by the unequal development of this muscle is a good illustration of the effort of the organism towards self-help.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

By J. GUTTMANN, M. D.,

NEW YORK.

(QUARTER ENDING MARCH 31, 1901.)

The So-called Paradox Pupillary Phenomenon of Westphal-Piltz.

Antal, Dr. J. (Ungarische Medizinische Presse February 10, 1901.)

A. Westphal described recently a new pupillary phenomenon, which consists in the fact that rigid pupils (in tabes, paralysis), after forced squeezing together of the eyelids become smaller, when the eyes are again opened, and become larger, when light is thrown into the eye. Later he found this pupillary reflex also in healthy persons. After Westphal, Piltz described a paradox, or an inverse pupillary reflex, which according to him consists of the fact, that where the observer pulls apart with his thumbs the eyelids of the person whom he examines and then asks him to try to close his eyes and then to relax them. The pupils here act the same way as above: They become smaller at first, and then, notwithstanding the ingress of light they become larger again.

According to Piltz both symptoms may occur not only in rigid pupils but also in pupils, which react to light, whether promptly or tardily.

The author experimented with the view of ascertaining the pathognomic and diagnostic value of these two symptoms. These experiments were made artificially light. He used both the Westphal and the Piltz method.

For the sake of brevity he calls the first method the orbicular closure, the second the orbicular tension. In both of these methods the phenomena became apparent in two ways: (a) Upon opening the eyes the pupil, which was smaller than normally contracts still more and afterwards becomes slowly enlarged or (b) the contracted pupil becomes wider immediately after the closure of the lids.

Ad a) By orbicular closure he found this phenomenon present in facial paralysis, progressive muscular atrophy,

hemicrania, ulnar paralysis, paralysis agitans, neurasthenia, rheumatism, chorea, chronic gastritis, multiple sclerosis, athetosis, tabes, progressive paralysis, epilepsy, hysteria, Basedow, pavor nocturnus, and also in five healthy persons. In all these cases, the pupils reacted promptly to light, accommodation, and convergens.

Ad b) Orbicular closure. This phenomenon was present in cephalalgia, trifacial neuralgia, facial paralysis, hysteria and tabes. By orbicular tension i. e., after the tension has ceased, the small pupils become still smaller and afterwards enlarge, this was present in neurasthenia, hemicrania, chorea, athetosis, epilepsy, rheumatism, hysteria, chronic gastritis, multiple sclerosis and tabes, also in Basedow, pavor nocturnus, progressive muscular atrophy and lastly in five healthy persons. The other symptom (b) by orbicular tension, i. e., after the tension has ceased the previously contracted pupil becomes larger—this symptom was found in facial as well as in oculomotor-paralysis, hysteromania, paralysis agitans, hysteroepilepsy, chronic gastritis, tabes, epilepsy, progressive paralysis, etc.

The symptom of orbicular closure as well as of orbicular tension was absent in complete oculomotor paralysis, in pupils paralyzed with atropin, in multiple sclerosis, and progressive paralysis also in paralytics from tabes.

From his experiments the author concludes that the above mentioned symptom (a) of orbicular closure is a physiological function. When this symptom is less marked in pupils otherwise acting normally to light he considers this a prodromal symptom of such nervous affections in which the rigid pupil is either pathognomonic (tabes) or frequently present (epilepsy.)

He considers the above mentioned symptom (a) of orbicular tension equally physiological phenomenon, which may be distinguished from normal reaction to light by the fact that upon opening the eyelids the pupil is at first contracted and this contraction becomes more marked, when light falls upon it.

The symptom (b) of orbicular tension and closure can be seen in various nervous affections, it also occurs in adults.

The symptom of orbicular tension is much more reliable than orbicular closure and the Westphal-Piltz symptom when the reaction to light is prompt, or a late symptom, when the pupil no longer reacts to light, accommodation and convergence.

Massage In Optic Therapy.

Elschnig. Anton (Wiener Klinische Rundschau, March 3, 1901.)

The author has found massage very useful in several affections of the eye. Very good results were obtained in trachoma especially in chronic cases with thickened tarsus, cicatricial conjunctiva without follicles, marked pannus or progressive ulcerations of the cornea which are so resistant to other methods of treatment. In many of the cases cure was effected within a few weeks. The cicatrix, of course, was permanent, but without affecting the usefulness of the eye. Equally successful was he in those cases of frequently unrecognized recurrent keratitis resulting from a previous trachoma, which had left the conjunctiva cicatrized but succulent and hypertrophied. The massage must be energetic over the whole conjunctiva, but sparing the surface of the mucous membrane. He does this with a probe armed with cotton dipped into a solution of hydrarg. oxycyanatum 1:4000, which is introduced beneath the eyelid and pressed against the forefinger of the other hand resting upon the outer surface of the lid. A 2% solution of cocain was used only at the first two or three sittings, after that no anaesthesia was used. An icebag applied immediately after the massage caused the prompt subsidence of the inflammation. At first massage was carried out every day, afterwards every second or third day, the duration for each eye being five minutes. Following internal massage the outer surface of the lid was also rubbed with a well-anointed finger. In conjunction with other methods of treatment massage proved very useful in mild chronic cases—in really all cases of trachoma except perhaps in acute trachoma. He never saw any bad effects from massage. Massage proved also very useful in chronic conjunctivitis, especially in those cases with marked hypersecretion and retention of secretion in the Meibomian glands. In phlyctenular conjunctivitis massage proved a very efficient adjuvant to modes of treatment. Spring catarrh is best combated by direct massage of the excrescences of the eye. Chalazion which has not progressed too far may also be favorably affected by energetic massage. I in blenorrhoea of the lacrimal sac massage of the lacrimal sac carried out by the patient himself seems an excellent adjuvant to other methods of treatment. The value of massage in certain affections of the cornea-sclera is generally recognized. Massage hastens the absorption of blood in the anterior chamber and of encapsulated masses of the lens and also of exudates in retrogressive iritis.

The author has seen good results from deep massage in cases of affections of the retina, which resulted from circulatory disturbances, also in cases of albuminuric retinitis, and thrombosis of the vessels of the retina.

Ophthalmoplegia Totale Externa Oculi Utriusque.

Davidovitis, E. (Wiener Medizinische Wochenschrift. March 9, 1901.)

A 28-years-old man suffered from ptosis, the eyeball immovable either to right or left, vision and the pupil normal, the fundus intact. The previous history gave no clue to the cause of this condition. In case the lesion lay in the white matter of the brain, in the direction of the pyramidal tracts, then rotary movements of the head would follow by irregular jumping movements of the eyeballs, as Hgyes proved in his publication concerning associate movements of the eye. The lesion must, therefore, lie in the gray matter of the brain in the oculomotor nuclei; and according to Mauthner he is justified in considering this case as one of ophthalmoplegia nuclearis externa viz., polyoencephalitis chr. superior, a chronic degenerative process on the floor of the III ventricle and aqueductus Silvii with destruction of the cells in the nuclei.

Emphysema of the Eye.

By Dr. Ernest Fuchs. (Wiener Klinischer Wochenschrift, Jan. 24, 1901.)

The author in his article considers only those cases where for some reason or other (chiefly trauma) atmospheric air has invaded the structures of the eye. The structures chiefly affected are the eyelid, the conjunctiva, and the cellular tissues of the orbit.

I. Emphysema of the eyelid is the most common. This is usually the result of trauma. The eyelid becomes swollen, feels like a feather pillow and on palpitation the characteristic crepitation may be noted. The air may be squeezed from one part of the eyelid to the other, and in cases where the eyelid is rather thin we may actually see the air bubbles moving beneath the skin. The swelling is most marked over the inner angle of the eye.

II. Emphysema of the orbit is recognized by protrusion of the eyeball. In most of these cases there is also a co-existing emphysema of the eyelids and we may therefore assume that the protrusion is caused by the air behind the eyeball. In these rare cases where no emphysema of the eyelids exists, the question arises whether the exophthalmos is caused by a collection of blood or of air. The latter is more probable when the exophthalmos is decreased by pressure upon the eyeball with the finger and when exophthalmos is increased by forcible expiration.

III. Emphysema of the conjunctiva is the least common. It may become so intense that the scleral conjunctiva, bal-

looned out by the air, will occlude the cornea just like a curtain. Sometimes bubbles of air may be seen beneath the distended conjunctiva.

The factors governing emphysema in the vicinity of the eye are similar to those of other parts of the body, viz.:

I. Communication with one of the air cavities by means of a wound of the tissues of the conjunctiva, the orbit or the eyelid.

II. Air driven into these tissues from one of the air cavities by an increase of the air pressure during expiration.

III. Absence of an external wound on the surface of the eye, through which the impressed air may escape.

The air cavities near the eye are those of the nose and the various air cells which communicate with the nose.

Of these, however, we need consider only the frontal sinuses the antrum of Highmore, and the ethmoidal cells. The tear duct normally contains no air, but under certain pathological conditions air may be forced into it from the nose.

Fracture of the bony partitions separating these air cavities from the orbit may be the result of a direct trauma from without.

In a patient of Guhl's the eyeglasses of the patient were shattered by a stick of wood, a piece of glass being driven in deep beneath the lower eyelid and causing emphysema of the orbit. Berlin also relates a case where the ball of a revolver entered through the antrum into the posterior part of the orbit causing emphysema of the orbit.

The cases most commonly met with however are those where a comparatively insignificant contusion has occurred around the eye, e. g., a fall or a blow. In order that emphysema should occur in these cases it is necessary that air be forced into the tissues. This occurs commonly during forcible expiration, e. g., blowing the nose, sneezing or coughing. Usually the blood in the nose following a given trauma will cause the patient to blow his nose, and the emphysematous swelling following immediately after such an injury is naturally ascribed by the patient to such an injury. It often happens, however, that the emphysema does not come on till some time after such injury.

The author cites a few cases in his own practice illustrating this point. In a patient, admitted to his clinic, a piece of iron was driven against the eye, causing effusion of blood into the lid and rupture of the scleral coat of the eye. On the night following his admission to the clinic he had occasion to sneeze. He felt a sharp pain in the left eye, which immediately after protruded sharply. The next morning a

diagnosis of exophthalmos following emphysema of the orbit was made. In this case there was no emphysema of the conjunctiva or eyelid.

Another patient, while riding a bicycle, fell, striking upon the left side of his face. His fall, however, was not serious enough to keep him from his business that day. While at business he happened to blow his nose, expelling a bloody mucus from the nose. Immediately after this both lids of the left eye became swollen and emphysematous.

Many similar cases are met with in literature. Knapp tells of a case where three days intervened between the blow from a fist and the emphysema of the eye. Thompson saw a case where blowing the nose produced suddenly emphysema of the orbit and eyelids in a man who, ten years ago, was operated on for exostosis. In a patient of Gosse-
lin, fracture of the nasal bones occurred at the age of 24 and it was not until the age of 46 that epistaxis and emphysema occurred.

In the last two cases, if we wish to establish a point of relation between the injury and the following emphysema we must suppose that the original trauma left a weakened point in the wall of the orbit which was broken through during a vigorous blowing of the nose. These cases belong to the same category with the cases to be described later where emphysema was caused by merely blowing the nose and without any previous injury.

In the average case where, following a simple contusion, emphysema sets in upon blowing of the nose—in these cases we cannot find any wound of the skin, nor can we feel on palpation any fracture of the orbital margin.

Ordinarily the external force, e. g., a blow of a fist, is not strong enough to cause a fracture of the orbital margin. How then can the injury come about which resulted in open communication between the air cavities and the tissues of the orbit? We can feel no fracture of the orbit; we must therefore assume a fracture deeper down. There are three walls of the orbit that can be affected by such an injury—the roof, the floor, and the inner wall of the orbit. Of these three walls, the latter is the weakest in point of strength, indeed the lamina papyracea may very easily be crushed by a rather light pressure of the fingers. We therefore assume a fracture of the inner wall and in the opinion of Knapp & Gruening it is natural that in cases of injury to the orbital margin the inner orbital wall should be broken by means of contrecoup. Neither of these authors, however, speaks at all clearly concerning the mechanism of such contrecoup. The outer and upper part of the orbital margin are especially

exposed to external violence (the lower is partly protected by the nose.) A blow from directly in front will affect chiefly the outer and upper wall of the orbit and from there will be transmitted to the base of the brain. This is frequent cause of fracture of the base. How such a blow could fracture the inner orbital wall I could never understand clearly. I can understand that emphysema following contusions in the region of the orbit is caused by a fracture of its inner wall, but I have always been in doubt how this fracture is brought about.

I imagine that the blow regularly strikes not only the margin of the orbit, but also the eyeball itself. The eyeball, thus driven back into the orbit, forces the orbital fat to one side and thus the force of the blow is distributed equally over the bony walls of the orbit and the lamina papyracea, being the weakest, is unable to withstand such a force.

The author has been strengthened in this opinion by the observation that he never could find any emphysema when, as often happens, the trauma causes a rupture of the eyeball itself (rupture of scleral coat.) He knows of only one exception to this rule and even in that case the rupture of the eyeball was wholly atypical. The above theory seems very probable for we can easily imagine that the intact bulbus, which can be pictured as a hard, tense ball, should push aside the orbital fat. Such is not the case, however, with a ruptured and flaccid eyeball.

In order to test the correctness of his views, he asks one of his assistants, Dr. Walser, to try the same experimentally. With a wooden mallet he struck a cadaver a sharp blow directly upon the bulbus, the blow, however, not being strong enough to rupture the eyeball. Thereupon after plugging up the posterior nares, a colored fluid or air was forced into the corresponding side of the nose, in order to see if it would be forced into the orbital tissues. Such proved to be the case and upon dissection it was seen to be through a fracture of the ethmoidal lamina papyracea. The nasal mucous membrane as well as the orbital periosteum were torn over the point of fracture. The bone was depressed toward the nose. This proved that the bone had been broken by the pressure of the orbital contents and not by the subsequent injection of the fluid for in the latter case the bone would have been depressed towards the orbital cavity. This experiment explains clearly the mechanism of the emphysema in the usual cases following contusion.

Not as easily to be explained, however, are those cases where emphysema in the neighborhood of the eye follows a fall upon the occiput. Hilbert reports such a case. The

fall upon the occiput was not followed by any immediate symptoms, so that the patient was able to attend to his work until three hours afterwards, when emphysema set in and became more and more marked upon repeated blowings of the nose. The writer tries to explain the case in the following way. The eyeball, filled with a watery fluid is of greater specific gravity than the orbital fat.

A fall of the head upon the pavement throws the eyeball against the fat. This impact need not be very strong in order to break the fragile lamina papyracea.

Another mechanism of spontaneous emphysema lies in the vigorous blowing of the nose. He reports two such cases. In one case of a 19-year-old boy the lids became swollen immediately after a vigorous blowing of the nose. Examination showed an emphysematous swelling of the lower lid as well as the fornix of conjunctiva beneath which the air bubbles could be seen moving.

The oedema was very marked over the tear sac, but the sac itself was normal.

The other case was a 20-year-old boy where emphysema of the lower lid followed a strong blowing of the nose.

The author has found many similar cases in literature. The case of Desmarres was especially interesting. A man, 58 years of age, was in the habit of taking snuff. Whenever he grasped his nose between his fingers in order to blow his nose, his left eye was seen to protrude about $\frac{1}{2}$ c. m., while at the same time both lids became swollen. As soon as he released his hold upon his nose, the eyeball returned to its former position and the swelling of the lids decreased, but not entirely so that the patient had to expel the remaining air from his fingers.

The author concludes that in the majority of cases the emphysema is the result of fracture of the lamina papyracea through which the air enters the orbital tissues. He explains the tendency of the air being driven into the cellular tissues of the lid by the fact of the lessened power of resistance which the air finds in these tissues. The prognosis of emphysema is good because the air is absorbed in a few days by the application of pressure over the eye and by the avoidance of blowing the nose.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY E. E. BLAAUW, M. D.,

BUFFALO, N. Y.

ASSISTED BY

J. G. HUIZINGA, M. D.,

CHICAGO, ILL.

(QUARTER ENDING MARCH 31st, 1901.)

Transactions of the Seventeenth Meeting of the Netherlands Ophthalmic Society at Amsterdam, May 7, 1900. Twenty-four members and two guests; presided over by Dr. D. N. Van Rynberk.

The Apparent Accommodation of the Aphakia.

Dr. van den Brugh refers to Schoute's article (*Annals of Ophth.*, October, 1899, p. 611), and finds that Donders' theory holds for Aphakia with a determined degree of astigmatism. But Donders gave only his explanation for Aphaki, who were emmetropes before extraction. The author comes to the conclusion through calculation that the presence of corneal-astigmatism (Donders) explains the apparent accommodation of all aphaki. We find as a practical result, that an emmetropic aphakic eye, which shows apparent accommodation, must have a corneal-astigmatism, of which the degree at a fault of focussing of 1 dioptré must be between 0,75 D. and 1,25 D.

At a fault of focussing of 2 D., it must be between 1,25 and 2,75 D.

At a fault of focussing of 3 D., it must be between 2 and 4,00 D.

At a fault of focussing of 4 D., it must be between 2,5 and 5,5 D.

We find for a corrected hypermetropic eye at a fault of focussing of 1 D. it must be between 1 and 1,75 D.; at a fault of focussing of 2 D. it must be between 2 and 3,75 D.; at a fault of focussing of 3 D. it must be between 3 and 5,75 D.;

at a fault of focussing of 4 D. it must be between 4,25 and 8,25 D.

We see from these statements, that an emmetropic-aphakic eye draws more profit for near vision from the same degree of corneal-astigmatism than a corrected "common"-aphakus. Discussion:

Straub operated five years ago for cataract on a myopic eye. After operation a myopic astigmatism of six dioptries was present; patient had a vision of 1/VI for all distances up to 1/VI meter; ergo pat. could accommodate 6 dioptries. This case exactly suits to the theory of Donders; however Straub does not accept it.

Blok showed that Straub's case does not fit to the theory of Donders, because according to Donders the vision must be the maximum, when the distances of the object towards the eye are justly ∞ , that the images formed by the eye come in the focussing lines; in Straub's case the vision is equal for all distances.

Sterilization of Eye-Drops.

Dr. Jochems showed small bottles entirely after the principle of Dr. Stroschein, Würzburg (v Graefe's Archiv. Bd. 38 1892), where the rubber stoppers may be sterilized. He also turns the pipette and boils four minutes, the fluid losing in that time 10%.

Injection In the Corpus-Vitreum.

Prof. Snellen Sr., for extirpating soft bulbi, injects a sterile solution with a little cocaine into the corpus-vitreum thus raising the intra-ocular tension and lessening the pain.

A Case of Retinitis.

Dr. van den Brugh was first consulted by a little girl, age 10, on account of diminished vision in the left eye. The child had no pain and was in perfect health as were also the parents and other children. She was positive that a week before she had used her left eye and at that time it had perfect sight. Lids, conjunctiva, cornea, iris, pupillary reaction, etc., were all normal. V. O. D.=5/X, not improved by lenses; Javal 1,5 D. max. vert. V. O. S.=0,5/LX, not improved by lenses; Javal 1,5 D. max. vert.

Ophthalmoscopic examination showed O. D. normal and the same for O. S. except the absence of foveal and foveolar reflexes. The urine was normal. A simple collyrium was given. Six days later the ophthalmoscope revealed the edges of the disc to be indistinct, the veins somewhat enlarged and tortuous and the vicinity of the macula quite hyperemic. The author suspected choked disc or albuminuric

retinitis. Nevertheless, the urine, heart, respiration and pulse were all normal. No headache or vomiting.

A few days later the edges of the disc were swollen, the veins noticeably enlarged and tortuous and a small hemorrhagic spot on the disc. Within two days there formed delicate, white, radiating lines around the macular space. A noteworthy fact was that during the development of this condition V. gradually improved from 0,5/LX, to 5/L. For a week this condition remained unchanged. Then the edges of the disc again became visible, the veins became normal, the radiating lines disappeared, the reflexes returned and vision improved as follows: 5/L, 4/XXX, 5/XXX, 5/10.

Fourteen months after beginning of trouble V. O. S. = 5/10; Javal, 1,5 max. vert. and there appears an indistinct cicatrix just above and internal to the macula. No kidney trouble had manifested itself up to present time, a year and a half last treatment. Lead poisoning was out of the question and no cause could be discovered for the retinal manifestations.

A New Sound for Exploring the Frontal Sinus.

Dr. Struycken called attention to the uncertainty of having entered the sinus by the old method of sounding. He mentions the necessity of thorough cocainization.

The tip of the author's sound is made of flexible steel 2 to 2,5 cm. long. If this is passed into the sinus and a small compass placed against the forehead the opposite poles will be attracted toward each other. If, e. g., a patient is placed facing E. W. and the compass be placed above the eye-brow the direction of the needle will be changed from a N. S. to a more or less E. W. direction according to the greater or lesser distance of the one pole and the more or less approach towards the other one. If now the entire magnetized end of the probe is in the antrum and the compass be placed vertical the needle will turn exactly 180°. Often, however, one magnetic pole only will have penetrated the sinus in which case the patient must be placed N. S. and the compass be placed beneath the eye-brow in the internal-superior corner of the orbit. Here it will be easy to demonstrate the second magnetic pole. In this way the exact position and location of the end of the sound may be ascertained. The author demonstrated his method before the society on a skull. He also suggested the application of this principle to oesophageal sounding.

Ophthalmia Gonorrhoea Metastatica.

Dr. Lechner reported the following case: Mr. L. N., age 24, taken quite sick two weeks after appearance of urethritis.

The family physician reports that at this time the patient was suffering from a metatarso-phalangeal arthritis of the right foot simultaneously with a conjunctivitis in both eyes with profuse discharge and considerable photophobia.

Treatment consisted in application of Priessnitz bandage to foot and instillations of $\frac{1}{4}\%$ solution of silver nitrate twice daily in the eye. The conjunctivitis healed rapidly. A complicating keratitis not being favorably influenced by instillations of a $\frac{1}{4}\%$ solution of atropin sulph., the author was called in consultation three weeks after the beginning of conjunctivitis. Eye symptoms present at this time were a considerable redness without swelling or discharge, more particularly on the right side. Complete mydriasis of the right pupil and the cornea clear except for two small facets where ulcers had been. The cornea of the left eye was somewhat disturbed, several small ulcers were present and the pupil slightly narrower though perfectly round. Treatment: Atrop. sulph., 1% solution and hot fomentations. For ten days patient made satisfactory progress when suddenly a severe pain developed in and around the left eye with T.+3, cornea quite opaque and vision reduced to little more than light perception. Oblique illumination revealed a shallow anterior chamber, congested iris and an irregular pupil filled with exudate. A 1% solution of eserine sulph. was used that night and an iridectomy performed upwards the next morning. The apparent success obtained was soon neutralized by the formation of synechiae contracting the pupil and drawing it upwards. The pain disappeared, however, and T. remained normal.

Two weeks after the operation V. O. D.=5/V and V. O. S.=2/LX. Six weeks later V. O. S.=5/XXIV and ten weeks after this it had improved to 5/XII. The author emphasizes the following as tending to prove the metastatic origin of the disease. The conjunctivitis appeared simultaneously in both eyes with the appearance of inflammatory conditions in other parts of the body. According to the family physician it did not have the appearance of true gonorrhoeal ophthalmia.

The success following the instillation of so weak a solution of silver nitrate is unusual in considerable hyperemia of conjunctiva bulbi et palpebrarum with photophobia. The author asks whether the success was due to the local treatment or to the internal administration of salicylates by the family physician.

Neuritis Optica In Chlorosis.

P. Muntendam (Weekbl. v. geneesk. Oct. 27, 1900), looked up the literature about inflammation of the nervus opticus in chlorosis and found 20 cases; he adds the following history

from Prof. Straub's practice: A girl, 14 years old, came August 14, 1894, to the dispensary at Utrecht, complaining about the loss of vision on the right eye. Patient has a pale color and pale mucous membranes, did not yet menstruate; no syphilis, tuberculosis nor rheumatism in her previous history; urine normal; O. D. V.=O; no pupillary reaction, M. 1. D. $\odot$ As. 1 D. O. S. V.= $\frac{1}{2}$; M. 1 D. $\odot$ As. 1 D. In the right fundus a strongly marked papillitis with a few small hemorrhages; in the left one the process was less pronounced without hemorrhages. Salicylic acid had no influence as the vision of the left eye diminished after four days and the pupillary reaction had disappeared. The therapy was changed and as there were no other symptoms than those of chlorosis, ferruginous pills were prescribed. After three days some amelioration showed itself. O. D. V.=2/CC; O. S. V.=5/CC; no pupillary reaction. The papillitis in the right eye improved somewhat; the nervi optici with their regular swelling which transgressed only small border on the retina, appeared like typical "choked discs." The swelling disappeared quickly. On August 28 the pupillary reflex had returned. Vision improved from week to week. Sept. 10th, O. D. V.=5/LX; O. S. V.=1/L; for the first time central fixation. Oct. 15th, O. D. V.=1/III; O. S. V.=1/III. From the whole process remarkably white discs were the only results.

Neuritis Optica In Chlorosis.

Dr. F. D. A. C. van Moll, (Weekbl. v. Geneesk., Dec. 8, 1900), communicates the following historia morbi: Miss N., 22 years old, consulted me October 22, 1886 on account of cloudy seeing. O. D. V.=5/IX; O. S. V.=5/XVIII; refraction normal; other functional disorders absent. With the ophthalmoscope neuritis optica in both eyes, pale choked disc, without further changes. Patient had been always healthy. The only disorder is amenorrhoea. The trouble appeared acutely, after much bodily exertion and points at chlorosis. I ordered as little exercise of the eyes in near work as possible, dark glasses, dry cupping at the temples, hot hipbaths and internally pills with liquor stypticus. After two weeks the neuritis was getting better, vision on both eyes nearly 5/vi. She took daily 1 - 1,6 gram till the middle of March, 1887, when the vision and the ophthalmoscopic examination on both eyes was normal.

The Extent of the Dispersion-Circles on the Retina.

Dr. G. J. Schoute (Weekbl. v. Geneesk. Nov. 17, 1900), mentions different causes for dispersion-circles on the retina. A faulty accommodation in regard to the object, which gives an image on the retina; chromatic aberration of the incident light; spherical aberration, etc. It is easy to demon-

strate physically, for some, the extent of the dispersion figures; not so for those dependent on spherical aberration, of which the cornea is the chief cause. Here physiology is the mistress of physics. The absolute extent of the dispersion figures has never been measured, only that part, which was illuminated strongly enough to irritate the retina. Volkmann calculated the difference between the breadth of the retinal image, that he received from a certain object, and the breadth which this image should have been according to geometric computation, if no dispersion was present, thus he knew the perceptible difference. Helmholtz (Phys. Optk, 2d. Aufl. p. 398.) expressed his doubt about the conclusions because the objects, which were measured, were smaller than the diameters of the cones. It has been proved later, that the size of objects, the images of which being smaller than one cone, is judged not after the measurement of that image, but after the quantity of light which falls in the cone (vide. Schoute's inaugural dissertation, 1898.) Volkmann's tests do not teach us anything about the measurements of the retinal images or its dispersion-circles.

To study the dispersive images we can use skiascopy in the punctum fixationis; that is, the skiascopy of an eye, which fixes for the opening in the skiascopic-mirror. The examined eye must not move. The mirror alone may move, therefore, it is fastened to one end of a 60 centimeters long table, to be turned round a vertical axis. A horizontal arm is fastened to the mirror, which can turn over the plane of the table, so the mirror may be easily and exactly moved about. If the arm is 15 cm. long then the movement of its free end in millimeters corresponds with the movement of the light rays over the retina in tenth parts of millimeters. If we replace the mirror-opening by an illuminated object of the same shape, this will give on the retina a nuclear image and a margin of dispersed light around it. The reflected rays will come from these two parts. The rays from the nucleus always reach the mirror opening; while the marginal rays do the same, must go through a certain part of the pupil of the examined person, otherwise they are absorbed by the mirror. If we move a pencil of light over the retina by turning the mirror, some points belonging to the dispersion-margin will be lighted up at a certain moment; these points reflect in all directions, only a few rays reach the mirror opening and we see a small lighted segment while the rest of the pupil is dark. The lightened part of the pupil becomes larger by turning the light over a larger part of the dispersion margin. The entire pupil is lighted at the moment when the incident rays

reach the point, where the nuclear image begins. So we can deduce from the direction of the incidental light bundle in the different light phases of the skiascopic phenomenon 2 borders: 1° the extreme edge of the dispersion figure; 2° the margin of the nuclear figure. The difference between these two shows us the enlargement, which the retinal image gets through dispersion. The same point of the source of light sends to the two positions, necessary for determining of the borders, rays through the nodal point of the eye, which form an angle, equal to the turning angle of the mirror; we can thus compute the displacement of a light point over the retina. The method is objective. (Here follows a long list of different values for the breadth of the dispersion-circle in hundreds of micra at different points on the retina, varying between 3,6 (papilla) and 1,6 (centrum) and 3 (fixation at 15° of the retina), with the different widths of the pupil (6,125-4,5). At the same time formation of images at peripheral parts of the retina could be studied; it shows that it is little less accurate than at the retinal centrum. Not only the part of the dispersion, which is illuminated strongly enough to be perceived by the observed eye itself, is measured, but the whole dispersion. This is true for the large numbers. The color dispersion alone can give dispersion circles about 50 micra wide, so it is not to be wondered at finding for all instances together numbers between 200 and 300 micra. The absolute strength of the light source has little or no influence; the illumination was usually 32 candle units; first the members became somewhat smaller when the source was 0,64 candle-units, and much smaller at 0,32 units, probably because not enough light reached the observer's eye from places which can reflect the least light. The large numbers for dispersion from the optic disc are partly due to the difference in elevation, which the optic disc makes in the retinal plane, and because the light reflected from the optic disc compounded from all rays (they form a spectrum from red to violet through a prism), while that reflected from any other part of the retina contains only red rays. The amount of confusion to the sight caused by the dispersion circles does not depend on their absolute extension, but on the part which is illuminated enough to be perceived. As the periphery of the retina is more sensitive for weak light impressions than the centrum (although not very much) a larger part of the same dispersion circle will be perceived in the periphery, which explains why we see with the periphery less accurately as a less accurate formation of images at these places takes place.

The Normal Refraction of the Human Eye.

Prof. M. Straub, (Weekbl. v. geneesk. Dec. 1, 1900), was wondering when he first studied the principles of refraction, about the implicitly accepted hypothesis that emmetropia should be normal refraction. When a young medical army man, examining the eyes of the recruits he found them mostly emmetropic. This is very remarkable, as it shows that the length of the axis of the human eye is determined accurately up to one-twelfth of one millimeter in connection with the curvature of the cornea and the two lens surfaces; also because the new born as a rule are hyperopic.

Falkenburg examined, in 1892, 59 emmetropic recruits after thorough atropinization, six showed emmetropia, the rest were hyperopic from 0.25-2 D.; 41, that is $\frac{3}{4}$ of the cases showed a hyperopia from 1-1.5 D. We may conclude that the normal refraction is not emmetropia, if we define refraction as the average amount of refraction, when the accommodation is at rest. Those who will adhere to this condition must accept as the normal refraction H. 1-1.5 D., and will find that the normal refraction is not a sharply defined degree of hypermetropia, but as every physiological measure, between two extremes, a medium. In this case H. : 1.25 D. Emmetropia is also a condition, which rises from the condition of rest through a continuous exertion of the accommodation, a tonus of the ciliary muscle, the degree of which is different for different eyes, but always enough so, that the hyperopia present in every case becomes "corrected." This tonus is very strong, since the hyperopia becomes "latent" with lenses. It is an appropriate one. Its quantity is determined by the striving to arrange the eye for parallel rays, that is, so that the most distant objects can be seen with one glance without further accommodative exertion. Eyes, which are still emmetropic after complete paralysis of the accommodation, are also without tonus, an exception to the rule, that unstriated muscle tissue always has a tonus. Still we do better for practical and theoretical reasons to accept as the normal refraction an emmetropia, which arises in the slightly hyperopic eye by a very constant ciliary tonus, through a very accurate dynamic adaptation towards the function asked from the eye.

Many observers found hyperopia in the new born. De Vries examined 97 babies in the Amsterdam lying-in-hospital ophthalmically; he found 5 myopes, 14 emmetropes and 78 hypermetropes. Examination of 5226 school children at Amsterdam, aged between 6 and 13 years, showed $\frac{3}{4}$ of them already (dynamic) emmetropic at the age of 6. The myopes and astigmatici not counting, as possessing a pathological refraction.

tion shows that 83% of the school children, 6-7 years old, are emmetropic, that the typical newborn refraction only remains in 17%. In the later years we see hypermetropes continuously change into emmetropes, though only for a few per cent. A marked difference exists between the schools for the poorer classes and those where the pupils pay. In the first class we find 80, 6% E. with 19,4% H. at the age of from 6-7 years; 83% E. with 17% H. at the age from 11-12 years. Those where the pupils pay, show relatively more emmetropics, 89,4% E. with 10,5% H. at the age from 6-7; 90,6% E. with 9,4% H. at the age from 11-12 years. The children of the middle classes come nearer to the ideal refraction than those of the poor. The advantage of the first named is 7-10%. As the difference shows itself already for younger children, we must accept influences from without the school. We might suspect a hereditary influence, and some influence from some preliminary instruction (kindergarten), while the poorer children will be more in the street. The numbers show that all degrees of hyperopia become converted equally into emmetropia. The same conclusions hold for the higher schools.

We see another interesting fact, in demonstrating that emmetropia is the ideal refraction, in the fact that many emmetropic eyes have myopic structure. S. found emmetropia at the macula (examination in the upright image of the arteriolae maculares) in students, while myopia existed for the papilla. The myopic elongation of the eye begins round the optic nerve to later reach the posterior pole of the eye. The higher schools, which make one-third of the pupils myopic, do not spare the emmetropic ones. I do not think it accidental that a large part remain emmetropic. The emmetropia of the yellow spot forms a barrier, which is not so easily overcome.

The real emmetropia will be the refraction of the future. The exact reasons that make the eye emmetropic are unknown; we might surmise the pressure of the external muscles, and the continuous tonus of the ciliary muscles, giving on the long run another form to the anterior part of the choroid and to the corpus ciliare through which the zonula Zinnii becomes somewhat relaxed. The organic refraction change would little by little take over the work, which was done formerly by the contraction of the ciliary muscle. The process would find its natural stop, as soon as emmetropia became present, while the ciliary muscle was entirely relaxed. The physiologist needs a second hypothesis to explain the relative frequency of true emmetropia. He only has to accept that the myopia tried to intervene in the normal evolu-

tion and that these absolute emmetropic eyes could only keep emmetropia by abandoning the ciliary tonus, which belongs normally to unstriated muscle tissue.

To investigate this mechanism of emmetropisation of the normal eye the cases might be studied in which this process does not take place. We could ask if the imperfect vision or the imperfect binocular vision might be the cause of the hypermetropia, that is of the remaining of the infantile refraction. An affirmative answer would include, that normal visual acuity and good binocular vision promote the emmetropia.

Kouwenhoven made statistics of about 3877 eyes with good vision and without pathological deviations, in persons older than 35 years. All normal eyes need help at their 50th year: at that age there are more persons with H. 1 D. than emmetropes, namely 40.9% against 33%. One-third of the population has only normal refraction (E). The number of emmetropes becomes still smaller with increasing years. At the age of 65 it is only 10.95%. The hypermetropia increases in the same time. Till the 60th year H. 1 D. and 1.5 D. occurs the most. In the 65th year H. 2, and 2.5 D. occur nearly as often as H. 1 and 1.5 D. Donders explained the senile hypermetropia through changes in the lens. As we know now we need seek an explication for the younger presbyopes. Indeed the refraction of the majority of the normal presbyopes is the same as for the younger adults: H. 1-1.5 D. It seems the most plausible that the formerly latent hypermetropia becomes manifest in later life. Still we find at higher age a second increase of hyperopia for which we do not have an explanation and for which the lens may be made responsible. (See Donders.)

Papillitis.

Prof. Straub, (Weekbl. v. geneesk. Dec. 15, 1900), demonstrated a patient at the medical meeting at Amsterdam, who acquired, after a cold, red eyes with pericorneal injection, although the media are healthy. A few days later patient showed all signs of hyalitis with secondary iritis and keratitis; the inflammation progressed so rapidly that patient was taken into hospital, where a cure rapidly followed on administration of atropin and salicylic acid. In vain the primary focus was looked for. The corpus vitreum was again clear after a few weeks with only a little exudation on the bottom, but now papillitis of 5 D. was discovered on both eyes, similar to choked disc, the origin also was obscure. No sign of any latent brain process.

Intoxication with Hydrastis.

Straub mentions (ibid.) the history of a woman 48 years old, whose right eye was blind without pupillary reaction, the left one being normal. The right nervus opticus was pale through anemia. Patient suffered from uterine hemorrhages. S. thought that these might be the cause. But after two weeks the left eye also began to suffer, vision became $\frac{1}{3}$ with normal field of vision and small color limits, the nervus opticus became pale. Looking again for the cause S. suspected the hydrastis, which patient had used (for two months 40 drops 3 times a day), might have caused spasm of the arteria centralis retinae; therefore he stopped with this remedy and gave salicylas natricus. The process was worse a week later, vision being only $\frac{1}{6}$, the whole field of vision was small, no color perception and the pupillary reaction lost. S. gave now ferruginous pills for the anemia. A week later patient was much better; vision on the left was $\frac{1}{3}$, the right eye could discern light again. The field of vision for the right eye had returned and had become much larger for the left one. Again a week later V. O. D. was 2/LX, field of vision entirely normal, color perception centrally good; the vision for the left eye had improved, the pupillary reaction had returned. The question is if the anemia has been the cause of the trouble or if intoxication with hydrastis canadensis existed. S. will not decide, not knowing any analogue for the last supposition in literature. The papillae are still pale, but yellowish, being formerly bluish.

In the discussion Prof. Kuhn mentioned in regard to the first case that he once saw thrombosis of the sinus cavernosus after a purulent nasal catarrh and propagation of the inflammation on the vena ophthalmica and corpus vitreum, and asked if S. has thought about this probability. He asks in regard to the second case, if not some other intoxication could be the cause of the blindness, as it has happened after intestinal sepsis, which can reveal itself by ructus and flatus alone, and which is influenced often favorably by ferruginous preparations or metallic salts. Prof. Straub answered that no signs existed of sinus thrombosis, he thinks it worth the consideration of a partial sinus thrombosis.

Prof. Kuhn said a thrombosis at the wall gives nearly no symptoms as "some pain in orbit and pericorneal redness."

Prof. Straub answered a question of Prof. Pel, why he gave salicylic acid, that his experience taught him that it has often a good effect, even in cases where no symptoms of rheumatism are present, especially in retrobulbar-neuritis, which could not be eliminated here.

Prof. Winkler asked why the paleness of the papilla is not

dependent on a neuritis, why S. does not speak of a toxic neuritis and alone of anemia. Prof S.: The nervus opticus showed alone paleness and narrow vessels, thus anemia. He would expect in case of neuritis swelling and hyperemia.

Prof. Winkler denied that swelling and exudation belong to peripheral neuritis, especially in the lighter cases, he supposed that the color changes depended on a beginning neuritis with a light degeneration.

Prof. Straub: The neurologists often speak of neuritis, where degeneration alone is intended. The ophthalmologists call the degeneration an atrophy of the nervus opticus, which can be excluded here for different reasons.

Amblyopia Toxica Through Iodoform.

W. M. DeVries (Weekbl. v. Geneesk. Dec. 22, 1900), mentions the following case: T. G., 9 years old, was taken to the surgical ward on April 11, 1900 for a spondylitic kyphosis of the lower dorsal vertebrae and a hypostatic abscess on the left side under Poupart's ligament. Patient was placed in a plaster bed, the abscess was syringed regularly with 10% iodoform oil in glycerine, after which he sometimes showed slight elevation of temperature. The last injection occurred on August 17, when 200 grams was aspirated and 60 grams iodoform oil was injected. That same day patient got strabismus convergens with nystagmus. The next day he vomited a few times and complained about headache, pupils were very wide, but reacted well to light and convergence. Pulse 90-100, respiration 24-28, temperature somewhat higher (once 38.5°). Urine free from albumen and sugar. First a tuberculous meningitis was suspected. Patient did not vomit, however, on August 19th, nor on the following day, but the pulse became irregular; from the 21st the temperature became and remained normal. That day looking for possible paralysis of eye muscles the boy said he did see a part of the finger. An absolute central scotoma existed. A relative central scotoma for colors was present at the right eye; the fundus oculi was normal. On August 30th the position of the eyes was slightly convergent, the left eye is somewhat turned to the nose; the movements good in all directions, with small nystagmic contractions in the horizontal final positions. Left eye with absolute central scotoma has a vision of 1/LX; right eye with a relative central color scotoma has a vision of 1/VI. The diagnosis was amblyopia toxica, the only poison possible was iodoform. Therefore next day 70 grams pus was aspirated from the abscess, to lessen, if possible, the further resorption. September 6th, the urine contains still iodine. September 8th, the patient can read again a little.

September 14, O. D. V.= $\frac{1}{2}$ f.; O. S. V.= $\frac{1}{6}$. No more right scotoma; patient sees the colors centrally better than peripherically. In the left eye a scotoma for red is still present, October 15th O. D. V. more than $\frac{1}{2}$ (emmetropia.) O. S. V.=more than $\frac{1}{6}$, with as H. : 1 D. max. vert. : $\frac{1}{4}$. Field of vision normal. Urine contains still iodine.

In four months 490 grams iodoform-oil or glycerine were injected. A quick recovery took place without any therapy.

Eight cases of iodoform amblyopia are previously mentioned in the literature.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the Annals will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

The well known oculist Dr. S. Baeck, of Gieiwitz, is dead.

Professor Uhtoff, of Breslau, was recently elected Privy Medical Councillor.

Dr. A. Hitchcock was recently appointed Ophthalmic Surgeon at the Boston Dispensary.

Dr. Alexander Deas Davidson, of Swansea, a well-known ophthalmologist, died on December 7.

Dr. W. F. Norris was recently elected Vice-President of the College of Physicians of Philadelphia.

Dr. J. G. Huizinga, of Chicago, collaborator on these annals, was seriously ill this spring but has fully recovered.

Dr. B. A. Randall has resigned the position of ophthalmic and aural surgeon to the Methodist Hospital, Philadelphia.

Privatdocent, Dr. Schieck, now at Halle, will accompany Privy Counsellor von Hippel to Göttingen and remain with him there.

At the St. Joseph Hospital, Lorain, Ohio, Dr. H. Wooster Patrick, was appointed surgeon in the eye, ear and throat department.

Dr. H. V. Würdemann and Dr. Nelson M. Black announce that on May 10 their offices were removed to 105 Grand Avenue, Milwaukee.

Publisher Jones H. Parker has been ill for a month following attack of influenza; owing to his illness this issue of the Annals has been greatly delayed.

Dr. F. W. Harvey has been appointed Surgeon in the

Ophthalmological Department of the Royal Victoria Hospital, of Montreal, Can.

Dr. Seymour Oppenheimer has been appointed consulting otologist and laryngologist to the Hebrew Sheltering Guardian Society of New York.

Dr. Lucien Howe is ophthalmic and aural surgeon, and Dr. Julius Pohlman consultant in the new German hospital recently opened at Buffalo.

Drs. G. E. de Schweinitz, Charles A. Oliver, Howard F. Hansell, and John W. Croskey, have been appointed ophthalmologists to the Philadelphia Hospital.

Dr. Scurry L. Terrell, of Dallas, Tex., was appointed chairman of the Ophthalmological and Otological Section of the Central Medical Association of Texas.

Dr. Herman Knapp is enjoying an outing on the Mediterranean. We would wish our illustrious colleague pleasant journeying and a safe and speedy return home.

Dr. John E. Weeks has been appointed Professor of Ophthalmology at the University and Bellevue Hospital Medical College, to succeed the late Dr. Henry D. Noyes.

Dr. H. E. Lewis was elected ophthalmic and aural surgeon and Dr. Chietien Zaugg consultant at the annual meeting of the directors of the Fanny Allen Hospital, Burlington, Vermont.

Dr. Herman Knapp has recently presented to the New York Ophthalmic and Aural Institute the buildings used by it, on East Twelfth Street. These buildings are well arranged for the purpose.

Dr. Ulysses Higgins Brown, of Syracuse, N. Y., died suddenly on December 27 at the age of forty-nine years. He was a licentiate of the Onodaga County Medical Society in 1878, and was an ophthalmologist of repute.

There has been such an increased demand for that excellent work, "The System of Diseases of the Eye," by Drs. Norris and Oliver, that the publishers, J. B. Lippincott & Co., have been obliged to bring out a second edition.

Dr. H. V. Wurdemann, of Milwaukee, at the invitation of Dr. Frank Allport, delivered an interesting lecture Feb. 28, before the Northwestern University Woman's Medical College, upon the subject of "Injuries to the Eye."—(Ophthalmic Record.)

Archivos de Optalmologia is the name of a new monthly published in Madrid, of which the first number appeared January 8, 1901. It is edited by Martinez, and will try to represent the best (Spanish) literature of both the old world and the new.

The Thirty-sixth session of the Ophthalmological and Otological Society of Washington City, was held March 12, at the office of Dr. H. A. Polkinhorn, who represented the paper of the evening, on "The Use of Suprarenal Capsule in Ophthalmic Practice."

The Westphalian oculists met February 2, 1901, in the Hotel Wacker-Parmann, Dortmund. Among other papers discussed was one by Professor A. Peters, of Bonn, on "Acute Retrobulbar Neuritis," and also a paper on "Trauma of the Eye," by Dr. Fischer, of Dortmund.

The French Ophthalmologic Society will hold its annual session at the "Hotel des Societes Savantes, in Paris, commencing May 16 next. One of the most important topics to be brought up for discussion will be introduced by de Wecker, on the value of Iridectomy in Glaucoma.

Dr. Berenstein, of St. Petersburg, died of pneumonia on January 5, 1901. He was well known in Germany, and was much beloved by his colleagues in St. Petersburg. Born in Lithuania in 1865, he finished his studies in Dorpat. Was with Hirschberg, in Berlin, and Leber in Heidelberg. He went to St. Petersburg after he had been sometime in Lodz.

Richmond (Va.) News.—On the first of the month there was held a meeting for organization of the Ophthalmologic and Otologic Section as a branch of the Richmond Academy of Medicine and Surgery. It is composed of the members of the profession practising only on the eye, ear, and throat. The meetings will be held once a month at the different members' houses, the chairman of the meeting to be the entertainer of the evening. Dr. W. J. Mercer was elected permanent secretary.

Through the efforts of our colleague, Dr. Charles A. Oliver, the members of the Staff of Wills' Hospital in Philadelphia have formed themselves into an association known as the "Wills' Hospital Ophthalmic Society." The object of the association is to "Promote the scientific usefulness of the institution by the discussion of papers and the exhibition of patients who have been under the care of the members of the Attending Staff." Meetings will be held twice a month and reports of the proceedings will be published.

At the ninety-fifth annual meeting of the Medical Society of the State of New York, held in Albany, January 29-31, Dr. Jacobi, of New York, Chairman of the Committee on Prize Essays, reported that the best essay submitted was written by Dr. Lucien Howe, of Buffalo. The essay was entitled "On the Measurement of the Inter-Ocular Base Line and the Size of the Meter Angle." The prize is \$100. We congratulate.—(American Journal of Ophthalmology.)

Philadelphia County Medical Society, Mar. 13.—Dr. W. L. Pyle read a paper on "Postpartum Metastatic Panophthalmitis With a Clinical and Pathological Study of a Case." This condition is rare since the days of asepsis. It usually comes on from five to fifteen days after labor, loss of vision often being the first symptom. Enucleation during the activity of the process is not without danger of meningitis and should be deferred. The case reported had developed ten days after forceps delivery of a woman who had been in labor fifty-six hours. Rupture had taken place before enucleation was done, a notable point being that it was so far posterior that the front of the eye was left intact.

Chicago, Eye, Ear, Nose, and Throat College.—This college on February 1 moved into a new building situated at 206 Washington Street, southeast corner of Franklin Street. The reason for this move was the hospital facilities having been added to the school, the building formerly occupied was not sufficiently commodious. The present building, which is a four-story and basement one, has the three upper stories given over to hospital purposes, the remaining two floors being devoted to recitation and out-patient rooms. The addition of a hospital to an institution devoted expressly to the teaching of eye, ear, and nose work is, we believe, a unique feature in this country.

Hammond records a case in which there was an injury of the cortex at the junction of the middle and posterior thirds of the superior temporal gyrus, and a second case in which there was an area of softening in the middle third of the second temporal gyrus. In both cases there was entire word-deafness, and in the second word-blindness. He believes that a lesion in any part of the speech-area may so disorder the mechanism of the associated speech-centers that any or all forms of aphasia may result and that there is as yet no real evidence that a single naming center exists and some evidence against such a view, and it is at least not very improbable that there is no such center.—(Philadelphia Medical Journal.)

Seven Thousand Dollars for the Loss of an Eye.—The Court of Civil Appeals of Texas, says, in the case of De La Vergne Refrigerating Machine Company vs. Stahl, that the verdict here returned of \$8,000 is much larger than that in any case which it has been able to find, or which counsel seem to have been able to find, involving the loss of an eye, with the usual consequences of such injury. Here the party seeking to recover damages therefor was a young man, a mechanic, 24 years of age, when hurt. And while the court considers \$8,000 as excessive compensation in such a case, it holds that the loss of an eye is a serious injury, and says that it will affirm the judgment if a remittitur of \$1,000 be made from the \$8,000.—(Journal American Medical Association.)

The Modified Open Treatment after Operations on the Eyeball.—E. Heimann condemns the customary tight dressing applied after operative procedures on the eyeball as exercising an undesirable amount of pressure, impeding the natural cleansing movements of the eyelid, being easily displaced and insecure, promoting the stagnation of secretion and growth of bacteria, and causing the patient great discomfort and annoyance. The treatment he recommends consists in the application of some form of dressing so contrived as to relieve the eye itself from all pressure and to permit unrestricted motion of the lids. This may easily be constructed of wire, rubber, celluloid, etc., and will protect the wound against infection and mechanical injury, without being open to the objections urged above.—(New York Medical Record.)

Cysticercus of the Eye.—Gallemaerts states that in certain cases it could be determined how long the cysticercus remained living in the interior of the eye; the longest period was seven years. The diagnosis is difficult in the beginning. The

presence of the cysticercus is positively demonstrated only by the presence of movements. De Vincentiis has proposed to excite these movements, so as to render them more apparent, by applying a faradic current to the temple. As soon as the diagnosis is made the extraction of the cysticercus must be proposed. This is the only way to preserve the organ and preserve vision. If the operation be performed early, the vision will be preserved in great part. As a prophylactic measure meats should be more carefully inspected.—La Policlinique, January 15, 1901.

The following announcement is made by the Literature Committee of the Colorado State Medical Society,
Edward Jackson, Chairman.

The Colorado State Medical Society offers a prize of \$25 for the best essay, if deemed worthy of the prize, pointing out the dangers to public health and morals, especially to young persons, from quackery as promulgated by public advertisements.

The competition is open to all. Essays must be typewritten in the English language, and submitted before May 15, 1901. Each essay must be designated by a motto; and accompanied by a sealed envelope, bearing the same motto, and enclosing the name and address of the author. The essay receiving the prize will become the property of the Society for publication. Others will be returned on application. Essays should be sent to the Literature Committee, Room 315 McPhee Building, Denver, Colorado.

Hinsdale reports a case of aphasia with letter-blindness without a word-blindness in a patient, a physician thirty-five years of age. He was suffering from pulmonary tuberculosis and suddenly had an attack of paralysis involving the right side of the face, the right arm, and the right leg. The paralysis disappeared rapidly in the course of a few days. Speech was almost completely lost during the first twenty-four hours. The patient could not speak the word "No." Sensation was not disturbed and the kneejerks were normal. Some time after the patient could not name objects although he could recognize them (word-deafness.) The patient also mispronounced some words, and incorrectly substituted words. During the patient's illness he regularly read the daily papers. When asked to read the alphabet, instead of saying "A," "B," "C," he would count "1," "2," "3," but when shown the words "boy" and "child" he pronounced them. He therefore had letter-blindness but not word-blindness. The aphasia persisted for nearly a year

and a half.—Journal American Medical Association and Philadelphia Medical Journal.

Dr. Harold Wilson has examined by methods similar to those of Allport, the eyes of the Detroit school children at the instance of the Board of Education. "A total of 1,936 children, or 6.7 per cent, is reported as having defective eyesight, and nearly one-half of this number, 923, or 3.2 per cent, wear glasses. In 1897 the Supervisor of Physical Training reported 1,205 pupils with defective eyes, and 415 wearing glasses. Among the Grade Schools, the Clay reports 16.6 per cent with defective eyesight, and 7.2 per cent wearing glasses; the Cass, 12.1 per cent and 6.2 per cent respectively, while the Garfield has only 1.8 per cent with defective vision and 0.8 per cent with glasses, and the Lyster about the same number. The Eastern High School—the only High School the report from which is complete—has 12.2 per cent with defective vision and 13 per cent with glasses. The cause of such a wide discrepancy between schools of similar grade would be a very proper subject of inquiry. It does not appear in the statistics in my possession."

Tubercles in the Optic Thalamus and in the Cerebellum.—Louis Spillmann and L. Nilus report a case of this nature. The patient was a seamstress aged seventeen years. The principal symptoms were intense headache, absolute blindness, vomiting, Jackson epilepsy, with a pulse regular and rather rapid. Disturbances of memory or of the association of ideas were never noticed, neither were there any anomalies of sensation or motion. Intelligence was not dulled till the very last days of life; coma supervened without convulsive phenomena. At autopsy about a dozen small tubercles the size of a pea were found. They were seen in the middle of the right hippocampus. The optic thalamus on the left side was invested by a tubercle the size of an almond. The cerebellum was filled with tubercles, there being three in the right side and four in the left. Tubercles situated in the gray matter of the brain, in the optic thalamus, and in the white matter of the cerebellum of this patient did not give rise to any characteristic symptom; the symptoms observed were those commonly encountered in many cerebral affections. On this account there was difficulty in determining the exact seat of the tumor during life.—Gazette Hebdomadaire, December 16, 1900.

Relation of Eye Strain and Pneumogastric Reflexes to Digestive Disorders.—A. L. Benedict says that if we allow the

use of the term "eye strain," not in the usual sense of an effort to correct a visual error, but just as we would speak of cardiac strain, or strain of any other normal part by over-exertion, he is prepared to admit that it is a very frequent cause of acute gastric symptoms, such as nausea and vomiting. It is not safe to say that sick headache is always due to eye strain, but it does often result from a depression of pneumogastric function by ocular reflexes. The frequency of sick headache in summer is quite as much due to straining the eyes in brilliant sunshine for a long period as to the danger of fermentation in food on account of the heat. Scorchers' sick headache is a good example of the results of eye strain, caused by the effort to fix the eyes on the road while subject to constant vibration of the bicycle; the streaming past of the field of vision of objects in the road, the brilliance of illumination on a sunny day, etc., constitute an overexertion of the extrinsic muscles, the ciliary and the iris, as well as a prolonged and marked stimulation of the rods and cones. Car-sickness is, in some persons, a closely analogous condition and due to the same detailed causes.—*Medicine*, January, 1901.

Removal of the Right Upper Cervical Sympathetic Ganglion for the Relief of Glaucoma Simplex.—D. H. Coover reports the case of a man aged 65 years, upon whom this operation was performed. The immediate results of the operation were very encouraging, and were as follows: Tension was lowered to almost normal. There was contraction of the pupil and slight reaction. There was increase of the visual field and of visual acuteness, and the temporal field or nasal side of the retina improved, while the nasal field or temporal side of the retina did not improve. These conditions remained until an attack of supposed "cold in the eyes," which proved to be nothing more than the return of the former disease, glaucoma. The writer believes that the operation is of no service in glaucoma simplex when vision has been reduced to zero, as the final outcome of this case demonstrates, but may be of service in arresting the disease in the earlier stage and in retaining vision before atrophic changes have taken place in the nerve, retina, and choroid. After myotics and iridectomies have failed to relieve the disease, it is then that we are justified in advising sympathectomy in hope of relief from permanent blindness. Even then there is no assurance that the glaucomatous attacks will not return months afterward. The operation when performed by an expert is not dangerous.—(*New York Medical Record*.)

It is interesting fact that two of our historians, of international fame, William H. Prescott and Fr. Parkman, both suffered so severely with their eyesight that they were practically blind.

No one can read the life of William Hickling Prescott by George Ticknor (1860) without feeling compassion for him and at the same time be amazed at the fortitude shown in his work. Somewhere about the age of twenty-three his left eye was struck by some foreign body and became blind; shortly after his right eye became affected and he became practically blind. The doctors declared his whole condition to be due to a rheumatic affection, but as ophthalmology has become a science since 1854 he would perhaps today give it another name, "sympathetic ophthalmitis."

The life of Francis Parkman described by Farnham (1900) is a similar case. The loss of sight unfolded also his unconquerable ambition. But as his death is of a comparatively recent date, and some of the readers of the Annals must have known him, it would be of interest if we could get some ophthalmological information about Parkham.

Our curiosity as physicians is always aroused when we read of the bodily infirmities of illustrious men; this explanation is sufficient for inserting this item for the purpose of getting information on these points.

Training the Sight.

Lord Wolseley having lately remarked upon the good sight of the Boers as one cause at least of their good shooting, and having ascribed this good sight to its constant exercise in the open air, Mr. Brudenell Carter has pointed out that it is not merely a question of open air but of the training of the sight upon things that are far off and difficult to see. The defective vision possessed by so many children who have been brought up in towns is not caused by errors of refraction alone, common as these are, but by an actual deficiency in acuteness of vision, a lack of development in the nervous structures involved in the act of seeing. "Vision," he says, "like every other nerve function, must be cultivated for the attainment of a high degree of excellence. The visual power of London children is not cultivated by their environment. They see the other side of the street in which they live, and the carts and omnibuses of the thoroughfares. They scarcely ever have the visual attention directed strongly to any object which it is difficult to see, or which subtends a visual angle approaching the limits of visibility; and hence the seeing function is never exerted to anything like what should be the extent of its powers."—The Keystone.

Thyroid Treatment and Optic Neuritis.

The usual symptoms of thyroidism, emaciation, weakness, shortness of breath, nervousness, etc., are well known, but there are others occasionally observed that are less generally appreciated. If we are to regard exophthalmic goiter as the result of hyperthyroidization, we can see possibilities in the way of unpleasant symptoms that have not all been actually observed from the therapeutic use of the extract. However that may be, it is probable that observations on the increasing therapeutic use of the drug will from time to time bring out many important additions to our knowledge of its effects. One such has been editorially noticed in the Medical Press and Circular for March 6. The reference to the record is not given, but it states that Dr. Coppez, of Brussels, reports the cases of five patients, four of them women, in whom prolonged thyroid treatment for obesity produced well-marked optic neuritis, occurring several months after the beginning of the treatment, but then progressing very rapidly, vision being reduced to one-tenth in the course of a few weeks. No other symptom of thyroid intoxication appeared in these cases, but in some of them suspension of the administration sufficed to relieve the condition, and its connection with the treatment therefore seemed obvious. In other cases a prolonged course of tonics and the use of electricity were required. As the writer remarked, henceforth the inquiry as to the use of thyroid treatment will be in order in cases of optic neuritis of obscure etiology.—Journal American Medical Association.

**Eclipse Blindness With Thrombosis of the Retinal Artery—
Hemorrhage Into the Vitreous.**

At the Ophthalmological Society, Dr. R. D. Batten has reported the case of a woman aged 28, who watched the eclipse on May 28, 1900, without other protection than "screwing up the eyes" and looking between her fingers held close together. Objects immediately appeared black, and, next morning, she could see only "portions of things." On June 6, when she was first seen, she had lost the lower half of the field of vision in the left eye, $V=6/18$. Above the disc was a white patch, possibly an absorbing hemorrhage, and the hazy edematous retina obscured the view of the disc and retinal vessels. The edema increased until June 20, and then rapidly cleared, leaving a patch of choroidoretinitis above the disc. One of the upper-retinal arteries was occluded and the others were reduced in size. The vitreous opacities cleared

and the macula was unaffected. V. improved in the injured eye to 6/12. In the right it was 6/6.

Mr. Lawford said that he had observed three cases of eclipse blindness, but without ophthalmoscopic signs. In all, however, the scotomata had persisted with deterioration of vision. Mr. Jessop had published three cases. In all, vision improved, but there was a slight permanent scotoma. Mr. Bokenham gave details of two cases, in one of which there were retinal hemorrhages. V. improved from 5/60 to 6/12, but there was a marked central scotoma. Dr. G. A. Berry thinks the scotoma is usually permanent in the worst cases. The public is not aware that blue glasses are worse than useless in looking at the sun and bright lights. It is the blue and violet rays which do damage. In Russia, red or yellow glasses are employed.—*Journal American Medical Association*.

In the *International Monthly*, May, 1900, is a forceful plea by Dr. D. B. St. John Roosa urging state endowment for the advancement of medical science. The history of the rise and development of medical teaching in New York is briefly sketched, and it is shown that up to comparatively recent times all the medical colleges have resembled joint stock companies rather than independent teaching institutions. The alteration which has been effected in the constitution of medical colleges, it need hardly be said, has been productive of nothing but good. As Dr. Roosa remarks, this is one step forward, but he argues that the universities and colleges which now have the complete control of the medical teaching cannot, from their own funds or from private gifts, properly equip them. In the first instance, every medical school should be connected with a hospital of a size sufficiently large to provide ample material for clinical instruction, and the time is coming when the public at large will appreciate this. Next, and as important, is the necessity for a laboratory. The reason why Germany and France have been so prominent within the past thirty years in scientific research is not because of the superior ability or the more enduring patience and perseverance of their students, but because of the especial opportunities for pursuing investigations provided by a paternal and far-seeing government. In order to diagnose correctly various obscure diseases, trained men are needed. This training can be acquired only by a long experience in laboratory work. But a properly equipped laboratory involves the expenditure of much money. According to Dr. Roosa, two kinds of laboratories are required; one such as that in the Pasteur Institute in Paris.

and one like the Koch Laboratory in Berlin. He further contends that the state ought to provide sufficient funds for the adequate and thorough instruction of all the pupils in every medical institution already legally authorized and for such others as the increase of population may cause to be established under the regulation of the State. If this were brought to pass—and in a country so rich as America the difficulties in the way should be easily overcome—there is every reason to predict that American medical men would successfully compete with those of Europe in the investigation of disease and the saving of human life.—(New York Medical Record.)

An interesting study of the senses of savage peoples has recently been made by an English physician, Dr. W. H. R. Rivers, from data gathered by him on Haddon's expedition to Torres Strait and New Guinea. Says the *Revue Scientifique* (Paris) in a report:

"In visual acuteness, the savages are superior to Europeans. . . . This is doubtless due to the faculty and habit of observation. The savage is accustomed by necessity to notice the smallest details, and he finally acquires surprising facility and precision. But this special aptitude of noting details does not appear to be favorable to the development of the superior intellectual faculties; it would seem that the savage makes up for his advantages of sense by an inferiority of mind. And he is inferior also from the esthetic point of view; he does not appreciate the beauty of a landscape. Nearsightedness is rare with him; he is rather farsighted, and he adapts himself better than the European to passage from light to darkness; he also sees better in the night-time. His sense of colors is but mediocre, to judge from his vocabulary. Every one knows that Geiger and Gladstone several years ago asserted that the author of the Homeric poems must have been very little able to distinguish colors, because of the poverty of his vocabulary in terms of coloration. If this argument holds good—and this is disputed—certain savages can distinguish very few colors. Among those of Northern Queensland, there are only three words indicating color. In the island of Kiwai there is the same name for blue and black. The vocabulary would seem to show that the best-known color, and perhaps the one that was first distinguished from others, is red; those that are least clearly separated are at the violet end of the spectrum. Thus, on Torres Strait, the savages never confound red and green, but do confound blue and green. This imperfection is in marked contrast with the condition of the Esquimaux, who possess a highly developed color-vocabulary. As for hearing, the savages under

consideration do not appear to have aural acuteness superior to that of Europeans. But we must take into account the fact that the individuals examined were divers. This occupation does not tend to develop fineness of hearing. As for odor here also there is no superiority over Europeans in sensitiveness. The sense of touch is rather finer, but susceptibility to pain is less. Finally, the sense of weight is very delicate, more so than that of Europeans. And this is curious, for these people have neither the abstract idea of weight, nor the corresponding word."—Translation made for The Literary Digest.

A Case of Exophthalmic Goitre with Suppuration of Both Corneæ, Ending in Total Blindness.—Reported by Dr. Charles Stedman Bull. The patient was a married woman aged thirty-two years, whom he had first seen in November, 1894. About one year before he had seen her, she had been prematurely delivered of her third child at the eighth month of pregnancy, and was very ill with what was probably, from her account, post-partum hemorrhage. She had prolapsus uteri, which required some operative interference for its relief, and she almost immediately became pregnant again. During the fourth month of this pregnancy, both eyes took on a staring appearance and began to protrude. She became very nervous and short of breath, having at times attacks of dyspnoea which were asthmatic in character. Her heart beat very rapidly, and her general health failed. When Dr. Bull saw her, she presented all the signs of a typical case of exophthalmic goitre. Both eyes were very prominent, the protrusion being directly forward. Von Graefe's sign was present, an important symptom in the early recognition of the disease. Dalrymple's sign was strongly marked, the upper lids being retracted, and the conjunctiva oculi was very hyperæmic. The media were clear, the vision was normal, and the retina was very hyperæmic. Both lateral lobes of the thyroid gland were very much enlarged, the right more than the left, and evidently exerted some pressure on the larynx and trachea. The respiration was very rapid, 30 to the minute, and shallow. There was marked tachycardia, and a loud blowing murmur was heard over the base, which was probably anæmic. She was advised to come into the hospital for treatment, but as she was near her confinement she decided to remain at home. She was immediately put on iron and pilocarpine internally, and carefully watched. She passed through her confinement safely, and at the end of the third week presented herself again for treatment. The tachycardia was somewhat less marked, and the respiration less rapid and deeper, but the exophthalmos was unchanged. She presented

herself once a week for treatment until April, 1895, when the speaker went off duty, and he did not see her again until February, 1896. She was then again pregnant, and came with a severe inflammation of both eyes, which had evidently begun as ulceration of the cornea, which had rapidly gone on to suppuration. The abscesses had involved the entire cornea in each eye, and both cornæ had sloughed. There was, of course, total loss of sight, and as there was no perception of light in either eye, there had probably been total detachment of the retina as a result of the perforation of both corneae, and the sudden loss of intra-ocular tension. The eyeballs were still very prominent, the upper lids in a condition of extreme retraction, the thyroid was about in the same condition as when he had last seen her, and the tachycardia very marked (160). The ruptured eyeballs had nearly healed up by new masses of exudation when he saw her, but the case was, of course, hopeless. During the time that she was under treatment at the infirmary she was advised to enter the hospital wards, and have an operation for tarsorrhaphy performed for the purpose of narrowing the widened palpebral fissure, and thus diminishing the dangers resulting from the lagophthalmos, but this was declined.—New York Medical Record.

That the modern electrical engineer should have anything to learn from a fish seems improbable; yet it was recently asserted by an eminent English engineer, Prof. John Perry, that the study of the electrical eel and similar creatures may give valuable information regarding the transformation of energy. We can not yet approach the firefly in the economical production of light, and in the same way these electrical creatures are far ahead of our best dynamos in the economical transformation of mechanical into electrical energy. These remarks were called forth by a lecture on "Animal Electricity," delivered at the recent meeting of the British Association for the Advancement of Science, by Prof. F. Gotch, F. R. S. The speaker gave many interesting details regarding electrical fish, which are quoted below from an account in *The Electrical World and Engineer*:

"He said that every electrical organ in such fish was built up of columns containing a vast number of special structures arranged in series. The features were so distinctive that an electrical organ was as readily identified by its anatomical structure as a muscle was by the form of its muscular fibres. The organ column, he said, had its physical analogy in the voltaic pile. Where there were thousands of these elements in series, the total electrical effect became very considerable. The gymnotus electrical eel of South America had thous-

ands; the malapterurus, the fresh-water fish of North Africa, has tens of thousands; these fish, therefore, illustrating the familiar saying that there is force in numbers. The malapterurus was particularly astounding in this respect; the organ was in the skin and contained at least 3,000,000 disks; about 5,000 being arranged one after another, and this was repeated 600 times. 'The astonishing thing is,' said he, 'that whereas each of these disks is the receptacle for a nerve-ending, each half of the whole organ with 1,500,000 disks receives all its nerve branches from one nerve-fiber, the process of one giant nerve cell. The shock of the fish is of extraordinary intensity, but this is due to the number of individual elements concerned in the production of the electrical disturbance.' Here he exhibited a living specimen lent for the purpose by the Liverpool Corporation Museum, and experiments were made to show that the shock of the fish could effect the mercurial column of a capillary electrometer, and that in this way photographed records of the shocks could be obtained. Such photographic records showed that each shock is multiple; the electrical organ, once it has been made to produce its shock, will go on doing so automatically. The power of each blow—in other words, its electro-motive force—was astounding. In a fish about eight inches long he had determined that under unfavorable conditions the first electrical disturbance could reach a maximum of 200 volts."

Professor Perry, who is president of the Institution of Electrical Engineers, said at the close of the lecture that he looked upon the study which Professor Gotch had entered upon as of the greatest importance to engineers. He said, in effect:

"The best marine engines only yield for every shilling worth of coal one pennyworth of energy, eleven pennyworth being wasted. Ordinary engines return but one penny in 230 pence, a waste of 19s. 11d. Wastage is inherent in heat engines, but electromagnetic engines would be practically without waste, and would return 98 per cent of the energy of the fuel consumed. For years some of us have been working to burn fuel electromagnetically, and have succeeded in a clumsy, imperfect, expensive way. If the governments of the world would only expend 20 or 30 millions on the task, it would pay in the long run. Some one some time will succeed, but by that time the coal measures of the world will be exhausted. The electrobiological people are on the right track, and if they pursue it long enough they will ultimately show engineers how to build the ideal engine."

As to Quackery.—It is a curious characteristic of human nature, or of a great deal of human nature, that people who

would grudge paying a cent to a regular medical practitioner will cheerfully pay a great deal of money to an irregular. Go where you will and you will find the quack prosperous. His rooms are full of patients, and his patients are full of faith. Men and women will buy wondrous remedies from travelling mountebanks who do not disdain to sing a comic song on the wagon from which they peddle their nostrums. Natural bonesetters, and long-haired "Indian doctors," and botanic doctors ignorant of botany, and faith healers of many kinds, abound; and the trade of most of them is good. The world likes to be healthy, but it loves to be humbugged. If a thousandth part of the blind, unhesitating faith that cleaves so readily to incompetent, and often illiterate, practitioners of fantastic means of healing were bestowed upon religion, there would be no complaints that the churches are not filled. But often those who are full enough of doubts of the supernatural so far as it relates to their souls are quick to believe in an almost or altogether supernatural gift of quack salves to cure the body. Legislation can do but little if anything to interfere with the gains of the medical pretenders or of the professors of visionary and semi-religious medical "science." You cannot legislate away a state of mind; and the state of mind of thousands, perhaps millions of persons, is one of crass credulity in humbug. Their delusions and illusions can be removed only by experience and a wider knowledge. They take their own lives and the lives of their families in their hands when they neglect the methods and the agents of modern medicine and surgery and resort to the moonshine of Christian "science," or to any other crank system or to any individual quack. But you cannot prevent people from killing themselves if they have the will; and you will only stimulate faith in quackery by giving it a chance to yell "Persecution!" A private arrangement between patient and "healer" will nullify any provision of law forbidding the "healer" to heal for a consideration. A gift can take the place of a fee; and "gratuitous" treatment can be acknowledged with a gratuity. The best way to deal with a delusion is to let it alone. Common sense must win in the end.—New York Sun.

Two Cases of Amblyopia Following the Use of Jamaica Ginger.—John Dunn reports these cases, one of which was in a boy aged nineteen years, the other in a man aged thirty-nine years. The former drank two bottles of Jamaica ginger and some essence of lemon, while the latter drank four bottles of the ginger and some paregoric. The object was to "sober up." The two cases were seen, one four, the other two months after the attack. In both there was optic atrophy

with changes in the diameter of the retinal vessels. The history is as follows: The attack begins with nausea and vomiting, which are followed after a varying length of time, "twelve to forty-eight hours" (Woods), by total blindness. This blindness is preceded by dimness of vision. At this time there are no visible changes in the fundus. As a rule, the vision after a few days is partially restored. Neuritis may be demonstrable in the fundus after a few days, going on to atrophy. The vision after a few months seems to grow worse rather than better, and suggests nerve-fibre degeneration. The pupils, when the blindness is not absolute, respond directly, consensually and in accommodation. The field of vision has nothing absolutely characteristic, there may be more or less concentric contraction for white, with a central scotoma, or, as in this second case in which vision was reduced to $\frac{8}{200}$, there could be demonstrated no contraction of the field for white. The color tests are inconclusive. While in the cases we have accurate accounts of the appearances in the fundus as seen after atrophy has set in, we have no satisfactory detailed description of the changes in the fundus visible during the first few days after blindness occurs; nor has in any case the microscope had its say as to what the changes really are.—Virginia Medical Semi-Monthly, January 25, 1901.

Movements of the Eye in Reading.

Reading, one of the commonest occupations of our life, is, as every one knows, curiously, and often disastrously, fatiguing. Eye specialists have long urged that the reading in schools is the real cause of the recent marked increase of short-sightedness (myopia). Again, careful tests have shown that some persons can read even four times as fast as others who possess apparently an equal amount of intelligence. Here, then, are problems of practical importance. Can printing be done in such a manner as to lessen fatigue, to prevent the increase of short-sightedness, to increase the reader's speed and facilitate his interpretation of the matter before him? Such problems are now being investigated by experts in laboratories of experimental psychology. In a recent number of the American Journal of Psychology, Dr. E. B. Huey contributes an unusually interesting article from the Clark University laboratory, which may clear up some of the mechanical details of this problem.

The cornea of the left eye was rendered insensitive to pain by the use of holococain, and a very light plaster-of-Paris shell, with a hole drilled through its center, was attached directly to the eyeball, being held in place by suction. This

shell was connected with a system of light aluminum levers in such a way that the movements of the eyeball were traced in an enlarged form upon a moving sheet of smoked paper. By ingenious electrical devices, the traveling point of the lever recorded not only the movements of the eyeball, but also the speed with which these movements took place, and the time occupied by the eye in each movement could be correctly determined down to a thousandth of a second. This is what the tracings of the lever showed according to the account just mentioned:

"The eye moves over the matter line by line in all cases or in very nearly all. The movement along the line is in no single case continuous, but by quick jerks of varying length. . . . The return sweep of the eye is almost invariably unbroken until near the end, when an occasional halt is made apparently to enable the eye to get its bearings in a new line. [These halts] are more numerous in the long line passages than in the shorter ones."

In reading a *Cosmopolitan* article, the average number of movements to each line is slightly over three, and the ordinary newspaper line gives nearly the same result. A line of but 21 millimeters [less than an inch] length may be read without any lateral movement whatsoever. The eye seldom moves along the whole extent of the line. It starts from a point somewhat to the right of the left margin, and then moves, by a series of jerks, to a point to the left of the right margin. This indentation is usually greater at the right.

Another interesting feature is that of the speed with which the eye jumps forward along one line, and sweeps back to start the next. Dr. Huey found that all the jumping movements, although they varied considerably in length, occupy, curiously enough, about the same time, approximately forty-four thousandths of a second. The return sweep of the eye, although it traveled three or four times as far as it did in making the short jumps, occupies only fifty-five thousandths of a second.

How long, now, does the eye remain still between each of the forward jumps? Careful measurements are given to show that the pause generally occupies about one hundred and eighty-five thousandths, i. e., about two-tenths of a second. "Skimming" decreases this time. "The passages read at maximum speed show a decrease in the length of the reading pause, and, as the speed of movement is not increased, it would seem that increase in speed in reading is brought about solely, or at least mainly, by decreasing the number and duration of the reading pauses."

The author concludes that the ordinary newspaper line possesses the length which is most favorable to the reader's eyes. We understand that, as a result of these investigations, the final reports of the present national census are to be printed in two narrow columns instead of one wide one as formerly.—(Literary Digest.)

Program.

Section on Ophthalmology.—American Medical Association Meeting at St. Paul, Minn., June 4-7, 1901

1. Address of Chairman.
2. Treatment of Strabismus; Measures Other Than Operative.—Dr. Edward Jackson, Denver, Colo.
3. Treatment of Strabismus; Operative Measures.—Dr. C. F. Clark, Columbus, Ohio.
4. Strabismus: Its Treatment.—Dr. A. E. Davis, New York City. (By invitation.)
5. The Cosmetic and Visual Results in Squint.—Dr. J. M. Ray, Louisville, Ky.
Discussion opened by Drs. C. M. Oliver, Frank Allport, and F. C. Todd.
6. Concerning the Check Ligament.—Dr. J. E. Colburn, Chicago, Ill.

Wednesday, June 5—Morning Session.

Exhibition of Specimens and New Instruments—Fiftieth Anniversary of the Invention of the Ophthalmoscope—Exhibit of Ophthalmoscopes and Ophthalmoscopic Literature.

Address on the Origin and Development of the Instrument, Together With a Description of the Historic Exhibit of Ophthalmoscopes and Publications on Ophthalmoscopy Prepared for this Meeting.—Dr. H. Friedenwald, Baltimore, Md.

Address on the Life of Helmholtz.—Dr. Casey A. Wood, Chicago, Ill.

7. The Comparative Values of Hyoscin, Atropin, Homatropin and Scopolamin as Cycloplegics.—Dr. C. H. Baker, Bay City, Mich.

Discussion opened by Drs. Leartus Connor and C. M. Cobb.

8. Tarsadenitis Meibomica.—Dr. M. F. Weymann, St. Joseph, Mo.
9. Report of a Case of Retroflexion of the Iris.—Dr. A. A. Hubbell, Buffalo, N. Y.

Discussion opened by Dr. Eugene Smith, of Detroit.

Wednesday, June 5—Afternoon Session.

10. Treatment of Heterophoria; Non-Surgical Measures.—Dr. George M. Gould, Philadelphia.

11. Treatment of Heterophoria; Surgical Treatment.—Dr. G. C. Savage, Nashville, Tenn.
Discussion opened by Dr. S. D. Risley.
12. Table of Paralysis of Ocular Muscles.—Dr. H. M. Starkey, Chicago, Ill.
Discussion opened by Drs. F. C. Hotz and William Wilder.
13. The Extraction of Hard Cataract Without Iridectomy.—Dr. S. D. Risley, Philadelphia, Pa.
Discussion opened by Drs. H. V. Würdemann and F. C. Hotz.
14. Relation of Asthenopia to Disturbances of the Digestive System.—Dr. John McReynolds, Dallas, Texas.
Discussion opened by Drs. C. A. Wood and J. E. Weeks.
15. Ocular Lesions Associated With Constitutional Diatheses.—Dr. H. I. Jones, San Francisco, Cal.
Discussion opened by Dr. W. F. Southard.

Thursday, June 6—Morning Session.

Exhibition of Specimens and New Instruments.

16. Economic Limitations of the Visual Acuity in the Various Trades and Professions.—Dr. H. V. Würdemann, Milwaukee, Wis.
17. Further Report on the Visual and Aural Qualifications of Transportation Employees.—Dr. Frank Allport, Chicago, Ill.
18. Mules' Operation. With Cases.—Dr. Frank C. Todd, Minneapolis, Minn.
Discussion opened by Dr. L. Webster Fox, and Frank Allport.

19. Plastic Operations for the Preservation of Sightless Stumps.—Dr. Frank Gifford, Omaha, Neb.
20. Report of Two Cases of Orbital Surgery.—Dr. Adeline Portman, Washington.
21. Enucleation in Two Minutes, With Demonstration.—Dr. A. T. Mitchell, Vicksburg, Miss.

Thursday, June 6—Afternoon Session.

22. The Newer Pathology of the Retina, With Special Reference to the Changes Produced in the Ganglion Cells by Certain Toxic Agents.—Dr. H. Friedenwald, Baltimore, Md.
23. Atrophy of the Retina.—Dr. D. S. Reynolds, Louisville, Kentucky.
24. A Case of Blindness Due to Drinking Bay Rum Compared With Reported Cases Due to Methyl Alcohol and Jamaica Ginger.—Dr. H. Moulton, Fort Smith, Ark.
Discussion opened by Dr. H. Gifford.

- 25. Complete Recovery from Double Neuroretinitis, Clinically Resembling Albuminuric Retinitis in a Case of Prolonged Hematuria with Symptoms of Bright's Disease.—Dr. C. A. Veasey, Philadelphia, Pa.
 - 26. Some Points to be Observed in the Use of the Perimeter.—Dr. George F. Keiper, LaFayette, Ind.
 - 27. A Study of the Color Changes in Chromogenic Bacteria. Dr. C. A. Oliver, Philadelphia, Pa.
 - 28. The Value of Excision of the Superior Cervical Ganglion of the Sympathetic in Certain Eye Diseases.—Dr. Geo. F. Suker, Toledo, Ohio.
- Discussion opened by Dr. Casey Wood.

Friday, June 7—Morning Session.

Exhibition of Specimens and New Instruments.

- 29. Herpes Zoster Ophthalmicus With Brief Report of Five Cases.—Dr. W. C. Bane, Denver, Colo.
Discussion opened by Drs. Edward Jackson and H. M. Starkey.
- 30. The Corneal Lesions of Acquired Syphilis.—Dr. William H. Wilder, Chicago, Ill.
Discussion opened by Drs. S. D. Risley and C. A. Wood.
- 31. Lacrimal Stenosis in Infants and its Treatment.—Dr. Dunbar Roy, Atlanta, Ga.
Discussion opened by Dr. G. C. Savage.
- 32. Metamorphopsia Varians With a Report of Three Cases.—Dr. William H. Dudley, Easton, Pa.
Discussion opened by Drs. J. E. Weeks and S. D. Risley.
- 33. Injuries of the Choroid. Dr. E. O. Sisson, Keokuk, Ia.
Discussion opened by Dr. H. V. Würdemann and Cassius D. Wescott.
- 34. New Instrument for Determining Position of Axes of the Eyes.—Dr. C. H. Williams, Boston, Mass.
- 35. Spontaneous Clearing of a Cataractous Lens.—Dr. Hiram Woods, Jr., Baltimore, Md.

BOOK REVIEWS AND NOTICES.

Atlas of Rare Ophthalmoscopic Conditions and Supplementary Plates to the Atlas of Ophthalmoscopy.

Oeller, Hofrath Dr. J., Prof. in the University of Munich, (Atlas Seltener ophthalmoskopische Befunde. The text translated into English by Thomas Snowball, M. A., M. D., (Aberd.) Part I, 5 plates with text, price \$1.50. J. F. Bergmann, Wiesbaden.)

Prof. Oeller is publishing a series of 5 more numbers as an addition to his well known Atlas of Ophthalmoscopy which will comprise the rarer ophthalmoscopic conditions. Those represented in the first part are:

1. Retinitis circinata with vascular changes.
2. Retinal striations and membranes in the vitreous.
3. Albuminuric chorio-retinitis.
4. Congenital posterior staphyloma.
5. Optico-hyaloid disc and conus.

The illustrations are of the same finish as those in the original atlas and will be found of particular benefit to teachers and students of ophthalmology. Each plate is accompanied by a text in both English and German. The atlas is highly commended by the editor to American ophthalmologists.

H. V. Würdemann.

Retinoscopy.

Thorington, James, A. M., M. D. Fourth Edition. Revised and Enlarged. Fifty-one illustrations, (twelve in colors.) Philadelphia, P. Blakiston's Son and Co., 1901. Price, \$1.00.

The author says in the preface to the fourth edition that "translations into French and German have been asked for and are in course of preparation," and I am glad to hear it; because, although the idea of retinoscopy had its birth in France and one of the best expositions of the principle (Fick) was written for Germans, yet both German and French literature is woefully deficient in the interest we show in refraction, and no student or practitioner, in either country, could have so clear, precise, or such a common sense guide to retinoscopy in all its details, as this little book of Thorington's. I say "little" intentionally, for it is not a large octavo, and has only 86 pages of type, wide margin and clear draw-

ings, but from beginning to end there is not a useless word nor an errant paragraph.

Enthusiasm may, of course, carry an author beyond the field worked by a slower or more conservative colleague; many good eye surgeons still obtain fine results by trial lenses, ophthalmometry, and the ophthalmoscope; some oppose the methods as interpreted to be "objective," for, although it is evidently independent of the patient's response, it nevertheless is not yet capable of being automatically documented, as a true objective method should. This has nothing to do with the book itself, however, as the student should use it, for, as a text book of practical refraction, it is invaluable. Those who have used the earlier editions will be glad of the newer one; those who are beginning to study the "Shadow-test" cannot do better than to purchase Thorington's book.

A. B. Hale.

A Manual for Students and Practitioners of the Eye, Ear, Nose and Throat.

Ballenger, William Lincoln, M. D. Assistant Professor of Otology, Rhinology, and Laryngology in the College of Medicine of the University of Illinois (College of Physicians and Surgeons); Professor of Otology, Rhinology, and Laryngology in the Chicago Eye, Ear, Nose and Throat College; Member of the American Otological and Laryngological Association; Fellow of the Chicago Academy of Medicine; Attending Otologist, Rhinologist, and Laryngologist at the West Side Free Dispensary, etc.

and

Wippern, A. G., M. D., Professor of Ophthalmology and Otology, Chicago Eye, Ear, Nose and Throat College.

In this handy volume Dr. Wippern has written the part treating of Diseases of the Eye and Dr. Ballenger that treating of Diseases of the Ear, Nose and Throat.

The chief advantage of a work of this kind is that it combines in one volume of 500 pages a description of those diseases that are often associated together as one specialty.

Its chief disadvantage is that the authors cannot do justice to themselves or the subjects they write about because of the limited space at their command.

The volume is one of a series of Pocket Text Books of uniform size and appearance published by Lea Brothers & Co., 170 pages are devoted to Diseases of the Eye, 97 to Diseases of the Ear, 79 to Diseases of the Nose, 69 to Diseases of the Pharynx, 68 to Diseases of the Larynx, and 10 to formulæ and prescriptions.

In the section on Diseases of the Eye more attention might have been given to examination and methods of diagnosis by

means of instruments of precision and less to anatomy. Since from $\frac{1}{8}$ to $\frac{1}{4}$ of all eye patients are said to suffer from keratitis of one form or another, its importance seems to be sufficiently great to have been worthy of more attention. The same is true with regard to sympathetic inflammation and less space might have been given to muscles. The chapters on conjunctivitis and glaucoma are good. Grammatical errors and those of construction are few. The cuts, though few and mainly reproductions from Testut's work, are good.

In many respects the part treating of Diseases of the Ear, Nose and Throat is superior to that treating of the Diseases of the Eye. Its composition, diction and style is of a very high order. The chapters on Suppurative Diseases of the Middle Ear and the Mastoid receive as much attention here as in the larger text books. Physiology, Pathology, and Surgical Anatomy receive such consideration as their importance demands. We are rather surprised that Catarrh of the Eustachian Tubes is not even so much as mentioned. The cuts are numerous and good and are of considerable assistance to the text in making the subject clear to the reader.

As a whole the work is neat in appearance and will be useful to certain students and practitioners. To those who do not have the time to read the larger and more complete works on these subjects this volume may well be recommended.

Huizinga.

The Optician's Manual.

A Treatise on the Science and Practice of Optics. Brown, C. H., Philadelphia. (Published exclusively in the Keystone, the Organ of the Jewelry and Optical Trades. Philadelphia. With illustrations. Fourth edition, 1901.) The character and tendency of the book has been set forth by Dr. Würdemann in his review of the third edition in the *Annals of 1899*, Vol. VIII, page 636, to which we refer the reader. The fourth edition is introduced by the preface:

"Three entire editions of the Optician's Manual have been sold in four years, a record of sales equalled by few works of a scientific character. This sustained demand, which has necessitated a fourth edition in so brief a period, is the best evidence of the scientific merit and practical value of the treatise. It has proved equally valuable to the student of optics and the practicing refractionist, and its worth as a text book has been highly eulogized by optical teachers. In its new silk binding this edition presents a handsomer appearance than any of the preceding ones."

The chapter of interest for the oculist is the fourth, on lenses, which contains practical points on the mechanical part of fitting glasses, not discussed in the text books of ophthal-

mology, which generally are left to the discretion of the optician and therefore often the cause of dissatisfaction. It treats of the material of which lenses are made, varieties of lenses, action of prisms, decentered lenses, optical center of a lens, mounting of lenses, spectacle frames and parts thereof, chromatic and spherical aberration, how to measure and test lenses. The book is well gotten up and has as frontispiece a picture of the late Prof. Donders.

C. Zimmermann.

The Functional Diseases of the Eye.

The Functional Diseases of the Eye. Schoen, Dr. W., Prof., Leipzig. (Die Functions-Krankheiten des Auges. Zweiter Teil. Ursache und Verhuetung der Erkrankungen der Netz und Aderhaut sowie des Ciliarmuskels.) With Atlas of 37 plates. Wiesbaden, J. F. Bergmann, 1901. Price, 20 marks. \$5.00. In the introduction, which is of a polemic character the author criticizes the attempts of his opponents to repudiate his investigations and conclusions of the first part of this work, and once more sets forth the principles by which he was governed in his studies. To enable the reader to use his own judgment as to these controversies, we would refer him to the answer of Prof. A. von Hippel in the February number of the "Klinische Monatsblätter für Augenheilkunde," 1901, p. 153.

The novelty of his method consists in applying to ophthalmology the anatomic examination of cases which had been observed during life, and the work is based on the dissection of 110 eyes. At first the normal anatomy of the ciliary region is described. The whole anterior half of the eyeball was imbedded in celloidin and cut in meridional sections, carefully avoiding lacerations lest the anatomic relations be altered. The ciliary epithelium with the zonula fibres is a continuation of the connective fibrous system of the retina, and thus the latter is adherent to the lens capsule. The indentations of the ora serrata are not physiological, but acquired by continuous action of certain influences in life, to which most eyes are exposed, so that in the adult this form probably is the rule, as well as the cavities described by Henle and Blessig. Neither the latter nor the serrated shape are found in children, which remained free from convolutions. The retina waxes gradually thinner towards the ciliary region until a single stratum of cells remains. Thus a circular line is formed, which is called the border of transition. 0.1 mm. in front of the latter is the agglutination border of the pigment epithelium of the choroid and the ciliary epithelium of the retina. It is the anterior limit of the primary ocular vesicle and in the child runs as a circle around the globe, dividing

ing the pigment epithelium in an anterior and posterior position. In the posterior portion of the pigment epithelium covers the retina loosely, in the anterior it adheres firmly to the ciliary epithelium. In the child the rows reach as far forward as to the border of transition. Between both lines the ciliary epithelium is visible in regular rows. The eye of the adult, which cannot be called exactly diseased, shows the following chief changes: The transition of the retina is not gradual, but steep, frequently the retina is drawn out into teeth, spreading over the ciliary epithelium, and from this point arise zonula fibres. Transition border and agglutination line fall together, the intermediate portion consequently has disappeared. The transition border, seen from the surface, is no longer a line, but shows tooth-shaped processes which caused the name "ora serrata." If very marked, the agglutination line shows also indentations corresponding to the processes. The retina of the adult has Blessig-Henle's cavities.

The functional diseases of the eye are produced partly by subsequent irritation with or without general affections. Mechanical traction and irritation in cyclitis, chorio-retinitis and glaucoma are created by intense action of the ciliary muscle and propagated to the adjacent tissues through the tendinous fibres of the ciliary muscle and the posterior ends of the zonular fibres, or the muscle itself may become diseased from increased innervation and overexertion. The causes of contraction of the ciliary muscle are either functional, i. e., accommodation may originate in hypermetropia, presbyopia, normal astigmatism, maculae, cornea, poor illumination, unusually fine work, habitual approximation of objects, too strong concave glasses, insufficiency of internal recti or of convergence, vertical deviation of the eyes. Instead of iritis S. prefers the term cyclitis, because the ciliary region is chiefly affected. Twelve prominent symptoms of cyclitis are enumerated; the first group: Spasm of accommodation, consisting of accommodative position of the iris, i. e., very marked circular sulcus by bulging of the portion nearest the pupil, redness of the optic disk, pain, winking, lacrimation, contraction of pupil. Cyclitis proper shows, besides spasm of accommodation, pericorneal injection, coagulations in anterior chamber and deposits on posterior surface of cornea of detritus of the ciliary epithelium from the posterior chamber, synechiae which are no exudations of the iris, but fibrinous coagulations of the aqueous, seclusion of pupil. Irritation alone causes cyclitis simplex or iritis serosa, the complications with general disorders (syphilis, rheumatism, etc.), more severe parenchymatous forms.

The anatomical conditions are: (1) Mechanical changes

of the ciliary epithelium, transformation of the cylinders into cones, (2) inflammatory necrotic changes; proliferation, necrosis of nuclei, coagulation, granular and hyaline degeneration of the epithelium of the pars ciliaris and the fibre cells of the retinal border, analogous to the pathological processes in the epithelium of the kidney and the lens capsule leading to cataract. Destruction of the zonula fibres and the choroidal epithelium follow that of the ciliary epithelium. The treatment is directed toward the general disorder, the inflammatory attack (cocaine, atropine, hypnotics, rest, warm applications), irritation; absolute rest from near work, atropine and, as soon as possible, suitable spectacles, to which S. attributes the greatest importance.

The same etiology as for cyclitis exists also for chorioretinitis: irritation by contraction of the ciliary muscle and changes of tissue from impaired resistance. The influence of irritation is apparent from the points of predilection: the agglutination border, the entrance of the vertical veins and of the posterior ciliary vessels, i. e., where the accommodation traction acts, viz.: the place of origin of the zonula fibres and where it finds resistance at the two places of union of the choroid with the sclerotic. Thus S. distinguishes chorioretinitis anterior, media and posterior. The mechanical traction is shown by the development of teeth at the ora serrata and the inflammatory necrotic changes by the formation of Blessig's cavities. Adhesions between choroid and retina are recognized from the immigration of pigment into the latter, which may also be further propagated by lymph spaces and sheaths of bloodvessels. Syphilis and tuberculo-scapulosis act as predisposing diatheses. S. found in all cases of retinitis pigmentosa foci at the anterior portion of the choroid. In one-half of his cases he attributes the cause of retinitis pigmentosa to rachitis and convulsions in a great portion of the rest to astigmatism with accommodative traction. He sees the essential influence of consanguinity in convulsions either from rachitis or of accommodative nature in ametropia which is hereditary in some families. Atropine and proper correction by glasses give therefore a possibility of prevention of retinitis pigmentosa.

The third part of the book deals with glaucoma as a functional disease. Common to all forms of glaucoma are the central and peripheral disturbances of vision and the etiology, viz.: exaggerated innervation of accommodation. The primary anatomical changes are: traction of the optic nerve and subsequent excavation, traction of the retinal border to villi and formation of Blessig's cavities, degeneration of the ciliary muscle. Glaucoma is defined as a disease which partly rests on mechanical traction of various parts of the eye by

strained accommodation, partly on fatigue and degeneration of the ciliary muscle from the same cause with impairment of vision either directly, or displacement of the intraocular pressure or disturbance of circulation. Three chief groups of glaucoma are distinguished: 1. Traction and excavation of optic nerve by traction of the meridional fibres: Glaucoma simplex. 2. Extension of the ring formed by the exterior meridional fibres of the ciliary muscle, which in the healthy eye bears the intraocular pressure and displacement of the latter to the sclerotic; Glaucoma atonicum. 3. Prolongation of the suspensory apparatus of the lens and prolapse of the lens system: Glaucoma prolapticum. The physiological excavation is not congenital, but acquired by accommodation and is the preliminary stage of glaucomatous excavation. S. points out 17 important symptoms of glaucoma in tabular form and discusses them under special paragraphs. The chief difference S. claims for his doctrine of glaucoma from the usual is that it searches for the preliminary stages and thus prevents the outbreak of the disease. As soon as glaucoma is suspected innervation of accommodation must be prevented by proper glasses, etc., and all near work prohibited. This very frequently suffices to avert all future attacks. If, by giving out of the overexerted ciliary muscle, the intraocular pressure rests on the sclerotic miotics are in order, to effect contraction of the exhausted muscular fibres. Miotics do not affect the cause of glaucoma but help overcome the crisis, and are useless in absolute glaucoma. Iridectomy is only rational in secondary glaucoma from circular synechiae after cyclitis, by re-establishing the communication between anterior and posterior chambers. In primary glaucoma the obstruction of the sinus of the anterior chamber is not the cause, but the consequence, of the glaucomatous attack, since the prolapse of the lens system is due to increased pressure in the vitreous chamber and decreased pressure in the anterior chamber, i. e., the contrary of what is supposed to be the consequence of obstruction of the sinus. Therefore iridectomy can have no influence on the process. There is no anatomical proof of the efficiency of iridectomy. The latter is a roughly empirical procedure and no certain remedy of glaucoma. Out of 47 eyes examined by S. 31, which had not been treated etiologically, became blind. In prolaptic and atonic glaucoma opening of the anterior chamber entails great danger by favoring the prolapse. Iridectomy is innocuous in glaucoma simplex, but deleterious in patients suffering from atheroma. Extirpation of the cervical ganglion of the sympathetic may influence the glaucomatous process through its relation to the ciliary muscle, but is without healing power considering the anatomico-pathological changes. S.

lost every hope, from his studies, that an operation may ever be invented which will influence the anatomical changes of glaucoma. The last chapter brings 14 aphorisms to show what is not proven with regard to the glaucoma theory of v. Graefe-Donders. An atlas of 37 phototypic plates illustrates the anatomo-pathological conditions, on which S. based his conclusions. The book shows a great amount of industry and is very interesting on account of the novelty of observations and theories extremely deviating from those generally prevailing. Only very careful re-examinations will show how far they will be able to replace the latter.

C. Zimmermann.

The Tracts of the Brain and Spinal Cord.

Glaessner, Rudolf, Prag. (*Die Leitungsbahnen des Gehirns und des Rückenmarks, nebst vollständiger Darstellung des Verlaufes und der Verzweigung der Hirn- und Rückenmarksnerven mit 7 farbigen Tafeln.*) Wiesbaden, J. F. Bergmann, 1900. Bound, 3 marks. \$0.75. This book is intended as a guide to facilitate, by a short survey, the study of the extensive and complicated arrangement of the tracts of the human brain and spinal cord from the standpoint of the true natural direction of function. Not only the student but also the practitioner will find in it very useful orientation for the topic diagnosis of brain diseases. After some introductory remarks on embryology of the brain and the general arrangement of the nervous elements in neurons and the conduction of the nerve fibres, the various systems of medullary fibres of the brain and spinal cord are discussed and illustrated by plates, then the total course of the cerebral and spinal tracts, the directions of their fibres and functions (Plates II and III) the association systems of motor and sensory paths (Plate IV.) Part II demonstrates the course of all cranial and spinal nerves, segmentary innervation, distribution in muscles and skin, etc., (Plates V. VI and VII.) The innervation of muscles is arranged in tabular form of four columns, giving the names of the muscles, their origin and insertion, and of the nerves by which they are innervated. By using different kinds of type the survey is greatly enhanced. The plates, print and paper are excellent. We heartily recommend this useful book to our readers.

C. Zimmermann.

Atlas of Ophthalmoscopy.

Haab, Prof. Dr. O., Zurich, (Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis. Authorized translation from the Third Revised and Enlarged German Edition, edited by G. E. de Schweinitz, A. M., M. D., Professor of Ophthalmoscopy in the Jefferson Medical College, Philadelphia, Pa., etc., etc., with 152 colored lithographic illustrations. Philadelphia and London, W. B. Saunders & Co., 1901, p. \$3.50.

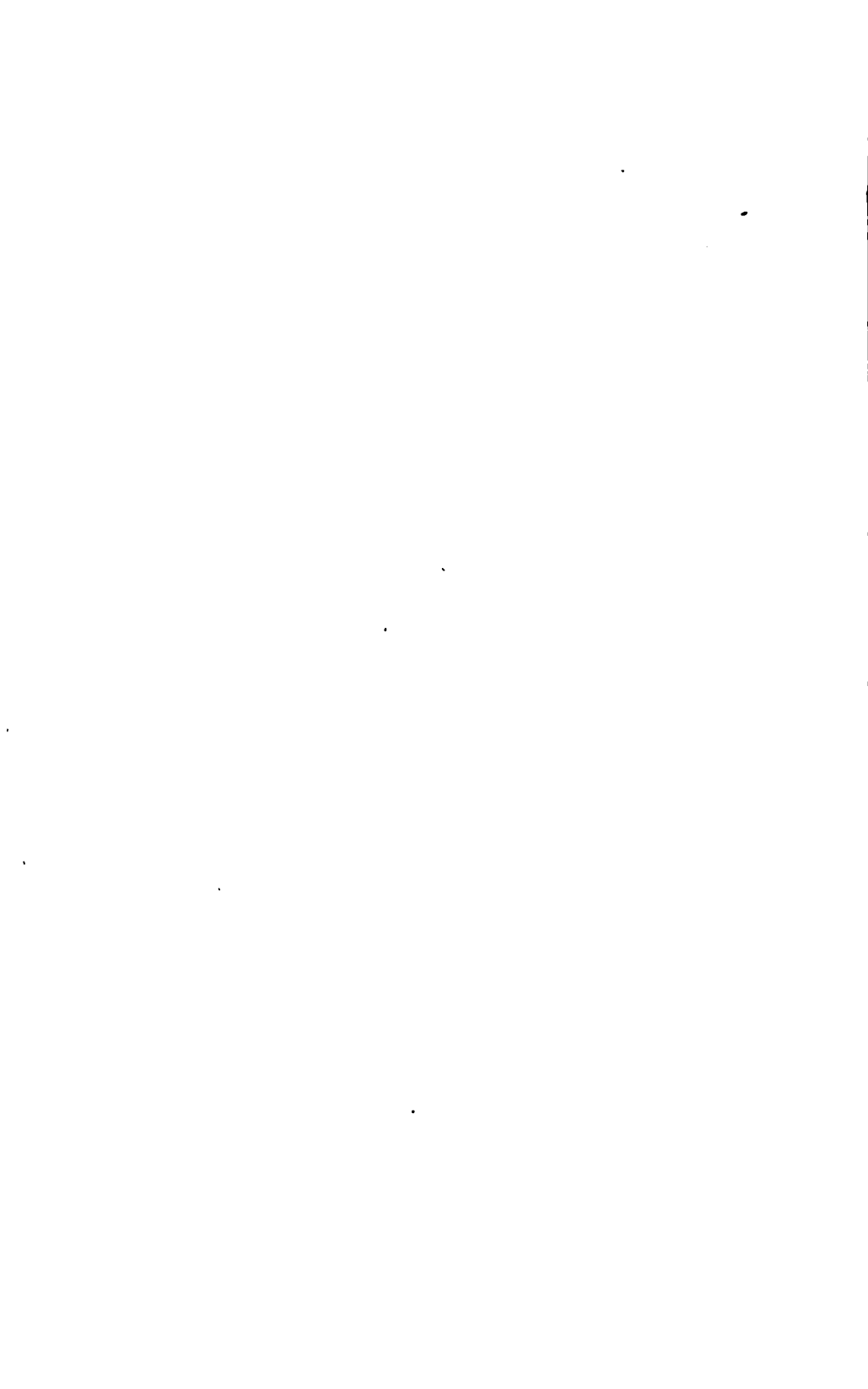
Within the course of a few years three separate German editions of Haab's Atlas have appeared and now comes a fourth edition in English much enlarged and improved. This English edition is rendered more valuable by a very complete index. The 80 pages of text, which are in addition to that accompanying the plates, have been carefully edited by Dr. de Schweinitz and are of particular value as an accompaniment to the balance of the book.

The following is a portion of the editor's preface:

"The great value of Prof. Haab's Atlas of Ophthalmoscopy and Ophthalmoscopic Diagnosis has been fully established, and entirely justifies an English translation of his latest edition. Not only is the student made acquainted with carefully prepared ophthalmoscopic drawings, done into well-executed lithographs, of the most important fundus-changes, but in many instances plates of the microscopic lesions are added. The whole furnishes a manual of the greatest possible service, not only to the beginner in ophthalmic work, but to one who has already far advanced and desires to compare the observations of his own service with those of the rich clinic from which Prof. Haab has gathered his plates."

This book will prove of great use to those who desire to study and teach ophthalmology.

H. V. Würdemann.



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No. 3.

ON THE MEASUREMENT OF THE INTEROCULAR BASE LINE AND THE SIZE OF THE METER ANGLE.*

BY LUCIEN HOWE, M. D.,

BUFFALO, N. Y.

ILLUSTRATED.

I. DEFINITIONS AND STATEMENT OF THE QUESTION.

The line joining the centers of motion of the two eyes has been called by Helmholtz, the base line (Basallinie, Grundlinie).†

The term meter angle (Meterwinkel) is a phrase proposed by Nagel‡ for expressing, in a general manner, the degree of convergence of the visual axes, in terms of the meter.

Thus, when the visual axes cross at a point situated one meter in front of the center of that base line, the degree of convergence was to be known as one meter angle. If they crossed at a point one-half a meter distant, the degree of convergence was to be two meter angles, if at one-third of a meter, then three meter angles, etc., etc.

This plan was so simple in theory that it was at once adopted by ophthalmologists, especially for the reason

*From advance sheets of prize essay presented at the annual meeting of the Society of the State of New York, Jan., 1901.

†Handbuch der Physiologischen Optik—Zweite Auflage, Seite 617.

‡Graefe und Saemisch B. VI S. 477.

that it enabled us to express convergence, at least relatively, in the terms of the meter, just as the metric system of numbering glasses enabled us to express accommodation, exactly, in terms also of the meter.

Unfortunately, however, the matter was not so simple in practice. For, as the size of the angle of convergence must depend on the length of the base line, in any given case it was necessary first to measure that line and then to calculate in degrees and minutes the actual amount which the visual axes converge when they cross at a given distance in front of the eyes.

In other words, the problem was, and it is still,

First, to obtain some simple method for making accurate measurements of that base line and,

Second, to construct a table which shows what the convergence is in degrees and minutes, when the visual axes cross at each fraction of the meter (meter angle) and this, moreover, for a base line of any number of millimeters, from the longest to the shortest possible.

It is the object of this paper to supply these data.

The reasons for doing so will be given at the conclusion.

II.—EARLIER ATTEMPTS TO MEASURE THE BASE LINE.

In former years various attempts have been made to measure the distance between the centers of the eyes and in doing so two plans have been adopted—one the subjective method, the other the objective. It is proper to glance at the first, if only to eliminate it from consideration.

(A) SUBJECTIVE METHOD.

The earliest instrument which we find was described by Smee as a visuometer. Although that instrument was used by Donders* and MacGillavry in their measurements of relative accommodation, it appeared to have many disadvantages and attempts have been made to improve it.

One of these was by Landolt.† He suggested an ingenious arrangement, but as it required an intelligent patient to use it, and often some practice by such a patient, that never came into general use.

*Accommodation and refraction, page 117.

†Annales d'Oculistique, Jan., 1874.

The writer of the present article had an instrument constructed like the one described by Landolt, but it was found difficult to obtain any constant results with it, even when the tests were made by intelligent patients, while with those unaccustomed to giving exact replies, it was unsatisfactory in the extreme.

Besides that, two models of a visuometer were made on the same principle as that described by Smee, but these also gave varying results.

(B) OBJECTIVE METHOD.

The subjective methods having been found impracticable, it became a question how to obtain some objective method which was both simple and reliable. Of course a rough measurement can be made simply by holding a rule in front of the eyes and reading off what appears to be the inter-pupillary distance.

But in doing this, the observer does not know whether or not his own eye is directly in front of the observed eye, and there may be an error due to the parallax amounting to one, two or more millimeters. Besides, it is difficult to keep the ruler steady when it rests simply on the nose. Recognizing these obstacles, some attempts have been made to overcome them by the use of a double ruler, and otherwise, but these results have been also unsatisfactory.

III.—TWO NEW METHODS.

As the result of various trials in this direction, the writer desires to call attention to two methods by which the base line can be measured to a millimeter. This seems to be proved by the fact that a reading with one instrument has often corroborated even to that extent a reading with the other. As such instruments have been called visuometers by Smee and others, that term should be retained here.

METHOD NO. I.

The instrument for this purpose consists of two millimeter scales parallel to each other held firmly just below the level of the eyes by means of a head band. In order to reduce still more any error from parallax, there are two 'sights'

which project about fifty millimetres in front of the anterior scale. The accompanying Fig. 1 shows the construction at a glance.

The instrument can simply be held against the forehead if desired, or it can be made more secure and the readings therefore more accurate if it be fastened around the head by a suitable band. See Fig. 1.

Having done this, the observer slides the double scale along the horizontal slot which is in the posterior plate, until the zero point with the right stationary projecting 'sight' is opposite the center of the pupil of the right eye. The other (the left) projecting sight which moves in a

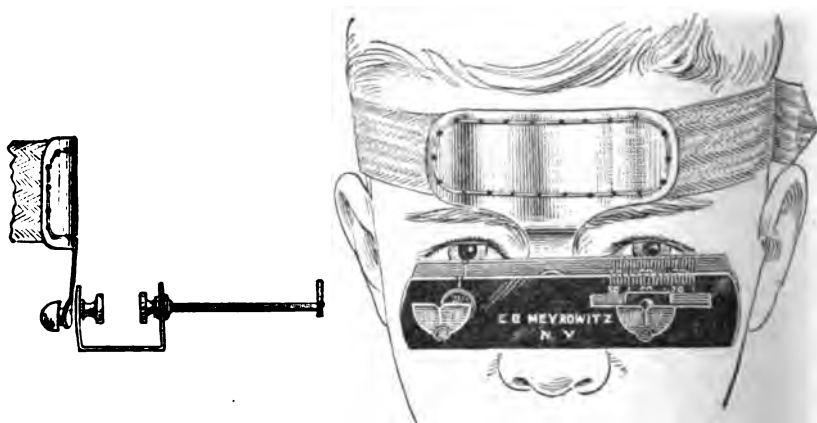


Fig. 1.

horizontal slot of its own in the anterior plate, is then slid along until that sight is opposite the center of the pupil of the left eye. The exact adjustment of these two sights often requires some little time and care—particularly at first—but when once accomplished, it remains only to read off, on the scale, the distance between them, and this is the base line.

METHOD NO. II.

In order that the results obtained by this instrument might be verified, an attempt was made to measure the base line by an entirely different objective method and apparently this has also been accomplished.

From a careful examination of the literature, it can not be found that the principle here involved has ever been

applied to measurements of the base line, although due credit should be given for a suggestion in this direction which was made recently to the writer by Dr. Tscherning, the Adjunct Director of the Ophthalmological Laboratory of the Sorbonne.

A small telescope with a micrometer eye piece is placed at such a distance from a millimeter measure that a certain number of divisions of the micrometer scale corresponds to a certain number of millimeters of the measure.

For example, suppose the telescope is at such a distance from the observed eyes (say 95 centimeters) that each



Fig. 2.

division of the micrometer scale covers just two millimeters of the measure. Then the person whose base line is to be measured fixes the head firmly (preferably in a head-rest) at the same distance from the telescope as is the millimeter measure, and a candle or a small lamp is placed one or two meters in front of the patient and at such an angle as to illuminate the eyes under examination and also the micrometer scale of the telescope. The patient is then directed to look at some distant object straight in front. As the observer looks through the telescope at the eyes, he sees on each cornea a minute point of light reflected from the candle. The distance between these two points

is then counted off on the micrometer scale and of course the corresponding distance in millimeters is known.

The arrangement is shown by the accompanying Fig. 2.

If the patient should focus the candle, a slight error in the measurement would result. But we need only calculate that error to appreciate that it has no real significance. That is easily done. Let us suppose the candle to be two meters in front of the patient, that he directs the visual axes to it, and while doing so, we find the length of the base line to be 60 millimeters. Then as the reflection really lies behind the cornea* (4 mm., i. e.) one half its radius of curvature.

We have

$$200 : 4 :: 30 : S B. = .06$$

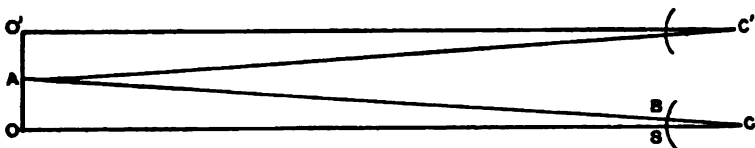


Fig. 3.

In other words with proper adjustment and readings the possible error would be only $0.06 \times 2 = .12$ millimeter.

It must be admitted that extreme accuracy comes only with continued experience with this method, but it is so simple as to be easily learned by those quite unfamiliar with laboratory technique.

IV.—ON THE SIZE OF THE METER ANGLE.

Having found thus two methods for measuring the base line, let us consider next the so-called 'meter angle' of Nagel. That is simply a convenient general term, as already stated, to express the amount which the visual axes converge, when they cross at a certain distance in front of the center of the base line.

We have observed also that the real value of that meter angle must vary—being larger in proportion as the base line is shorter.

In this part of the inquiry, therefore, we wish to ascertain exactly what that "meter angle" is equal to, in degrees and minutes, for a base line of any number of mil-

*See Tscherning—Lecons d'optique physiologique, page 6.

limeters. In order to do this, let us recall a diagram which has already been used in physiological optics. Fig. 4.

In that figure OO is the base line and at each end of this line, as well as at the central point, perpendiculars are erected. The two lines at the extremity of course represent the visual axes when the eyes are in the primary position, while the lines OR — OF — OP represent varying degrees of convergence.

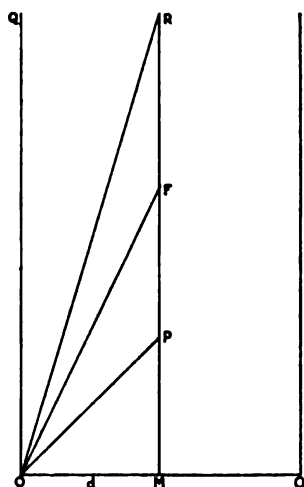


Fig. 4.

In order to find the angle of convergence, let us call $OM = d$ and the distance of the object from the eye, (MR ,

MF , etc.) $= n$, then (Meter angle) $= \frac{d}{n}$ meter.

We might expect that somewhere in the literature there would be a table giving the angle at which eyes would converge with all possible lengths of the line OO .

Thus far, however, no such table exists. It is true that Nagel* has calculated the size of this angle for all possible variations in the length of the base line OO from 55 millimeters to 75 millimeters, but this calculation is made for a convergence of only one meter angle. That is, it corresponds to the first vertical column of angles in the table here given.

*Graefe und Saemisch Band VI Seite 481.

He has also made a calculation for all possible variations in the degree of convergence from one meter angle up to 20 meter angles, but this is only for a person who has an interocular base line of 64 millimeters. That is the same as the one horizontal line of angles opposite 64 in the table here given. These two columns of angles have been copied by Landolt* and others, and are often referred to in the text-books but none of the other meter angles has been expressed in degrees and minutes. It seemed therefore that this table should be completed.† As here presented it explains itself.

The first vertical line to the left gives the length of the base line in millimeters. In the first horizontal line, the numbers 1, 2, 3, etc., indicate meter angles. If we know the distance between the two eyes, and the distance of the object, one can see at a glance the corresponding angle of convergence in degree and minutes.

REASONS FOR THIS STUDY.

Having thus called attention to two methods by which the interocular base line can be measured and having determined the size of each meter angle in degrees and minutes, it is natural to ask what is the use of so much exactness and labor. In other words, let us glance at the reasons for this study.

These are:

First. In order to make some slight addition to our knowledge. It will be admitted that no amount of pains is too great to establish a single fact in medicine and as there has been this portion lacking, even though it be small, in that chapter in ophthalmology, it seems worth while, if possible, to supply it.

Second. To attain greater exactness in correcting certain cases of ametropia. It is always convenient, and in certain cases of great advantage to determine accurately the interocular base line, in order that suitable glasses may be prescribed. In the large majority of cases, it is of course unnecessary to measure this distance so exactly,

*An incomplete form of this table was shown at the American Medical Association in '99 but no part has been published except the two portions by Nagel above mentioned.

†Traité Complet d'ophtalmologie, pages 184-185.

METER ANGLES.

	Distance between eyes															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
53	34.30	00.40	43.60	18.70	51.90	20.11	03.12	43.14	19.15	57.17	36.19	16.20	57.21	36.22	16.23	57.24
56	35.30	12.40	45.60	20.70	52.90	21.11	04.12	44.14	19.15	58.17	37.19	17.20	58.21	37.22	17.23	58.24
57	36.30	24.40	47.60	22.70	53.90	22.11	05.12	45.14	20.15	59.17	38.19	18.20	59.21	38.22	18.23	59.24
58	37.30	36.40	49.60	24.70	54.90	23.11	06.12	46.14	21.15	60.17	39.19	19.20	60.21	39.22	19.23	60.24
59	38.30	48.40	51.60	26.70	55.90	24.11	07.12	47.14	22.15	61.17	40.19	20.20	61.21	40.22	20.23	61.24
60	39.30	00.40	53.60	28.70	56.90	25.11	08.12	48.14	23.15	62.17	41.19	21.20	62.21	41.22	21.23	62.24
61	40.30	12.40	55.60	30.70	57.90	26.11	09.12	49.14	24.15	63.17	42.19	22.20	63.21	42.22	22.23	63.24
62	41.30	24.40	57.60	32.70	58.90	27.11	10.12	50.14	25.15	64.17	43.19	23.20	64.21	43.22	23.23	64.24
63	42.30	36.40	59.60	34.70	59.90	28.11	11.12	51.14	26.15	65.17	44.19	24.20	65.21	44.22	24.23	65.24
64	43.30	48.40	61.60	36.70	60.90	29.11	12.12	52.14	27.15	66.17	45.19	25.20	66.21	45.22	25.23	66.24
65	44.30	00.40	63.60	38.70	61.90	30.11	13.12	53.14	28.15	67.17	46.19	26.20	67.21	46.22	26.23	67.24
66	45.30	12.40	65.60	40.70	62.90	31.11	14.12	54.14	29.15	68.17	47.19	27.20	68.21	47.22	27.23	68.24
67	46.30	24.40	67.60	42.70	63.90	32.11	15.12	55.14	30.15	69.17	48.19	28.20	69.21	48.22	28.23	69.24
68	47.30	36.40	69.60	44.70	64.90	33.11	16.12	56.14	31.15	70.17	49.19	29.20	70.21	49.22	29.23	70.24
69	48.30	48.40	71.60	46.70	65.90	34.11	17.12	57.14	32.15	71.17	50.19	30.20	71.21	50.22	30.23	71.24
70	49.30	00.40	73.60	48.70	66.90	35.11	18.12	58.14	33.15	72.17	51.19	31.20	72.21	51.22	31.23	72.24
71	50.30	12.40	75.60	50.70	67.90	36.11	19.12	59.14	34.15	73.17	52.19	32.20	73.21	52.22	32.23	73.24
72	51.30	24.40	77.60	52.70	68.90	37.11	20.12	60.14	35.15	74.17	53.19	33.20	74.21	53.22	33.23	74.24
73	52.30	36.40	79.60	54.70	69.90	38.11	21.12	61.14	36.15	75.17	54.19	34.20	75.21	54.22	34.23	75.24
74	53.30	48.40	81.60	56.70	70.90	39.11	22.12	62.14	37.15	76.17	55.19	35.20	76.21	55.22	35.23	76.24
75	54.30	00.40	83.60	58.70	71.90	40.11	23.12	63.14	38.15	77.17	56.19	36.20	77.21	56.22	36.23	77.24

but quite sufficient to hold a ruler in front of the eyes and read off what seems to be the distance between the centers of the pupils.

On the other hand, when the glasses are very strong, the patient often experiences inconvenience if the centering of the lenses is not accurate. At least, it can be said that care in this respect adds to the comfort of the patient, and to the credit of those who prescribe and who make the glasses.

It is therefore convenient for this purpose to have some simple means of determining the interocular base line, and either of the two methods here described are adapted to such clinical requirements.

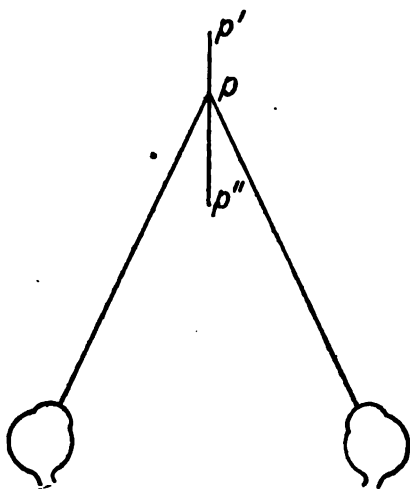


Fig. 5.

Third. The most important bearing of this study is its relation to relative accommodation and convergence. In order to show this, it is necessary to recall a few elementary facts.

We know that when the visual axes converge to a point *P* for example, the individual must still be able to increase his accommodation up to a certain limit. This increase is shown by the ability to overcome *concave* glasses while still seeing the object distinctly, and the increased accommodation thus exercised, has been called the positive part of the relative accommodation, and can be represented in

diagram by the distance $P P''$. On the other hand, while the individual is still converging for the near point P it is possible, by placing *convex* glasses before his eyes, for him to relax his accommodation with relation to that degree of convergence. This relatively less amount of accommodation has been called the negative part of the relative accommodation and can be represented in diagram by the distance $P P^1$. Or the entire amount $P' P''$ is the range of relative accommodation. Now this relation is so important that Donders* has been careful to show what that is in emetropia and how it may change in ametropia.¶

Many subsequent writers copied these data and dwelt upon their importance. But of late the entire question has been opened by Perle† and especially by the very recent statements of Hess‡ who has reached conclusions quite different from any stated before.

Whatever variations of opinion there may be as to the relative range of accommodation possible, all writers on the subject agree that a certain amount of the positive portion of the relative accommodation must be "held in reserve" as the earlier writers stated it, and all are unanimously of the opinion that the relation between accommodation and convergence is one of the most important questions clinically which we have to deal with in ophthalmology.

Now a study on the various articles on the subject shows that at least part of the confusion is due to the methods of examination employed, and that a very important feature of these methods is the proper measurement of the base line and the size of the meter angle.

But with either one of the visuometers described, with such a table of angles as is here given, and with an instrument§ such as we now have for this purpose, the measurement of relative accommodation is no longer a process suited only for the laboratory, but is now adapted to the consulting room. For example, suppose that with either

*Graefe's Arch. f. Ophthalm. XXXV (4) 84-115.

¶Accommodation and Refraction, page 115.

†Ibid, pages 217 and 240.

‡Ophthalmologische Congress. Utrecht. 1899.

§Howe. Transactions of the Ophthalmological Society 1900.

one or both of these visuometers we find the interocular base line measures 61 millimeters. The patient is then seated before the simple instrument already referred to, for measurement of relative accommodation, and if we wish to measure what that amount is at one meter, the proper test type is placed at that distance.

We would then be ready to place the concave or convex glasses in succession in the clips of the instrument which hold them. But in order that the centers of these trial glasses may be exactly in the line of the axes of vision, we must ascertain what degree of convergence is necessary, at one meter with eyes having an interocular base line of 61 millimeters. Instead of working this out, from the formula already given, it is only necessary to refer to the table of angles where we find this convergence at one meter is $1^{\circ}-44'$. The clips on the instrument are therefore moved along the arc of the slot in which the clips slide, to a point corresponding to that angle, and the range of relative accommodation at one meter is at once determined by the strongest concave and convex glasses respectively, with which the patient can distinguish the test letters at one meter.

Next, suppose we wish to measure relative accommodation at one-half a meter. The proper test types are placed at that distance. Again in order to have the center of the test glasses in the line of the visual axes, we must know just what the degree of convergence is for an object placed at half a meter distant when the interocular base line is 61 millimeters.

It can of course be calculated. But instead of interrupting the observation in order to make the calculation, we simply refer again to the table and find that with a base line of that length the visual axes converge $3^{\circ}-29'$. Again therefore the clips bearing the glasses are slid along the arc of the slot, in which they are set to a point indicating that angle and it is only necessary to try in turn the proper concave and convex glasses in order to ascertain the relative positive or negative accommodation at one-half a meter.

Apparently therefore a knowledge of the interocular base line and of the size in degrees and minutes of the meter angle is of some real value clinically to practitioners

who desire to study certain perplexing cases of asthenopia and of asthenopic headache.

We have now two exact methods for measuring that base line and a table of meter angles already calculated. It is hoped that this may perhaps assist a little in advancing our knowledge of an obscure but important branch of ophthalmology.

CARCINOMATOUS DEGENERATION OF A PAPILLOMA OF THE CONJUNCTIVA WITH INFILTRATION OF THE EYELIDS.*

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AND

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ILLUSTRATED.

In the last number of Graefe's Archiv. für Ophthalmologie (Vol. LI, p. 127), O. Koptezky von Rechtperg reported a case of papilloma of the conjunctiva which had undergone carcinomatous degeneration, destroying the conjunctiva and penetrating into the interior of the eyeball. He was unable to find any similar case in literature, in which a histological examination had been made. The following case which is interesting from the involvement of the eyelids at the outer canthus, was seen at the Will's Hospital clinic. The history is as follows;

John Maher, Aet. 65, came to the clinic with a large granular mass covering the greater part of the outer half of the left eyeball, stretching well back into the retro-tarsal folds at the outer canthus and spreading over the outer half of the cornea. It presented a papillomatous appearance but was very friable, tearing readily when grasped with the forceps and bleeding freely. The outer two-fifths of both upper and lower lids and the external canthus were much thickened by infiltration and hard. The growth had been removed from the ball by another surgeon several months before, but had quickly returned and spread with great rapidity, assuming the proportions described. The man

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, Jan. 15, 1901.

was admitted to the hospital, and a portion of the tumor removed from the ball and submitted to Dr. E. A. Shumway for histologic examination, who reported it of carcinomatous nature. The removal of the eyeball and the portion of the lids involved in the disease was therefore advised and the operation at once performed. After enucleation there appeared to be no thickening of the deeper orbital tissues so that exenteration of the orbit did not seem advisable. The lids at the external canthus were then seized between the thumb and finger and all the

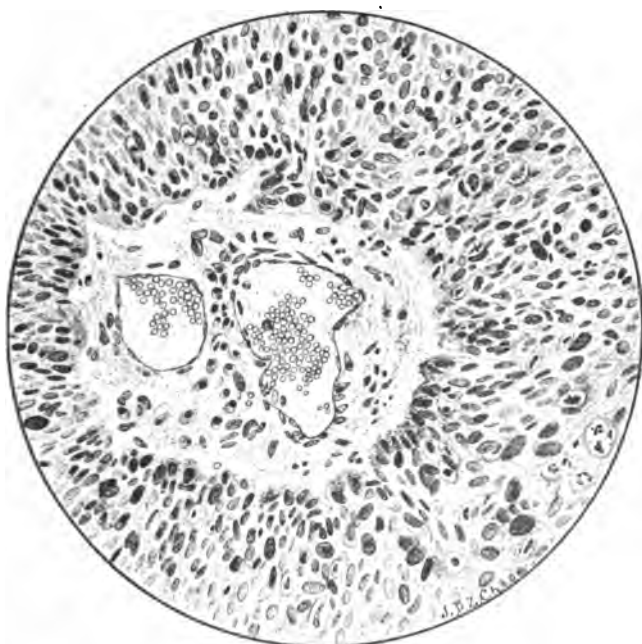


Fig. 1. Section of Growth from Conjunctiva Showing Cross Section of a Papilla, Unusual Size of Cell Nuclei, and Number of Karyokinetic Figures.

thickened portion excised with a pair of curved scissors. The mucous and skin surfaces were united with interrupted sutures. The recovery was uneventful and the man was permitted to return to his home in the interior of the state with the request that he report his condition by postal card every month. This he has done faithfully and reports that he is perfectly well. The eyeball and the portion of the lids excised were placed in Dr. Shumway's

hands for laboratory study. His report follows together with a bibliography of reported cases:

PATHOLOGICAL REPORT.*

The pieces of tissue from the conjunctival growth, and from the infiltrated eyelids were embedded either in celloidin or paraffine; the eyeball was embedded in celloidin, after careful hardening. Most of the sections were stained in haematoxylin-eosin. Those of the growth and of the eyelids approximated 10 micromillimeters in thickness. Sections of the eyeball were also stained for micro-organisms, by the Gram-Weigert method.

The specimen removed from the conjunctiva measures $10 \times 8 \times 6$ mm. It shows the typical arrangement of conjunctival papilloma which has been thoroughly described, in recent years, by Elschnig,² S. Fuchs,³ Wagenmann,⁴ etc. The central vessels of the branching connective tissue axes, are usually two in number, and possess very thin walls; they are distended with blood, and surrounded by a loose meshed, fibrillar connective tissue, which contains but few cells; here and there are collections of infiltrating leucocytes. In direct application to the connective tissue axes, are the epithelial cells which form the thick mantles. These cells (see Fig. 1) are worthy of especial attention on account of their size and arrangement. The innermost are cylindrical in shape, and are arranged with their long axes perpendicular to the axis of the vessel. There is but little evidence of a basement membrane, and, even in this position, it is almost impossible to distinguish the outlines of the cells, the nuclei seeming to be in a homogeneous ground substance. Further toward the periphery, where the cells are more irregularly arranged, this becomes still more marked; the nuclei stain deeply and are very large, measuring in some instances 23 micromillimeters in the long diameters (four times the size of a red blood cell), while nuclei which have a diameter of 19 micromillimeters are by no means uncommon. There are also an unusually large number of karyokinetic figures in all stages of development, and, in contrast to the ordinary forms of this tumor, there is very little flattening of the sur-

*June 25th, 1901. Report from patient two years after operation, no return of disease.

face cells, no loss in the staining power of the nuclei nor the slightest indication of a horny change. Scattered through the cells are occasional leucocytes; these are more numerous on the surface, and are mixed with blood cells, especially between the lobules composing the tumor.

The growth on the cornea was separated from the conjunctival portion, at the time of operation, so that the direct connection between them cannot be shown in the sec-



Fig. 2. Section from Infiltrated Eyelids. Solid Process of Epithelial Cells. Surrounding Tissue Infiltrated with Round Cells. Cross Section of Hair Bulb to the Left.

tions of the eyeball. Bowman's membrane is destroyed throughout the entire surface of the cornea, as far as the sections reach; the lamellae of the substantia propria are irregular in arrangement, and show a few newly formed vessels, and some round cells. The tumor occupies the temporal half of the cornea, and is composed of cells showing the same characteristics as those of the conjunctival portion, except that the nuclei are not so large, there are fewer karyokinetic figures, and the cell outlines can be more readily distinguished. The mass is about 1.5

mm. high, and is separated from the corneal lamellae by masses of round cells, so that there is no infiltration of the cornea itself by the epithelial cells. The deeper structures of the eyeball shows marked hyperaemia, and the posterior pigment layer of the iris is agglutinated to the anterior capsule of the lens, but, aside from these changes, the eyeball is normal.

On examining the sections of the eyelids, at the outer canthus, they are seen to be infiltrated with precisely the same cells as those of the tumor on the conjunctiva and cornea. The nuclei are large, oval, darkly staining and the cell outlines are rather indistinct. The type is the same, but their arrangement has been changed. Instead of central axes of connective tissues covered with epithelial mantles, we find solid processes of tumor cells, contained in definite alveoli, extending through the connective tissue of the eyelids, and accompanied by dense collections of round cells. (See Fig. 2). In other words, the tumor has changed in type from that of papilloma to that of carcinoma, and differs from the ordinary skin carcinoma of this region only in the type of the cells, which is that of the conjunctival epithelium, instead of skin epithelium, in the absence of whorls of cells—so-called “pearly bodies,” and of any attempt at a horny change.

This case like that of v. Reichtperg's, in which the cornea was destroyed by the infiltrating mass, is one of papilloma, originally benign, but, which, on account of its rapidity of growth, has become essentially malignant. So far as the literature at our command has sufficed, a similar case of secondary infiltration of the eyelids by a conjunctival papilloma has not been found. v. Reichtperg gives two cases besides his own, in which malignancy was shown. The first, reported by Horner,⁵ was that of a man 62 years old, in which there was recurrence after removal of a large papilloma, with subsequent destruction of the cornea and penetration of the globe. In the second, by La Grange and Mazet,⁶ there was a similar recurrence and involvement of the cornea. In neither of these cases had an histologic examination been made, so that v. Reichtperg's case was the only one published where malignancy was proved by the microscope. The majority of the writers on the subject: S. Fuchs,³ Grünert,⁷ Caspar,⁸ Weeks⁹ and others

have denied that papillomata of the conjunctiva ever become malignant, in the sense of destroying surrounding tissues, although among general pathologists (Hirschfeld,¹⁰ Billroth,¹¹ Ziegler¹²) the opinion has long been held that papillomata of the mucous membranes, especially those of the bladder, may, at times undergo carcinomatous degeneration. v. Rechtperg thinks that this has not been observed on the conjunctiva, because the growths have always been removed, as soon as possible, on account of their tendency to recur. His case, however, with those of Horner, and La Grange and Mazet, and the one reported by us, show that occasionally it may occur, especially when the age of the patient is advanced. This should, therefore, be an additional reason for their early and radical removal, together with all affected tissue, even of the eyeball itself, if the growth is distinctly adherent to it.

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GLIOMA OF THE RETINA WITHOUT SEQUAE.*

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The results of glioma of the retina are commonly fatal, either from the extension of the neoplasm to the surrounding tissues or by metastasis to the viscera, or because of the profound systemic exhaustion attending the disease, from which fatality enucleation of the affected eyeball and of the orbital contents offers no promise for the restoration of the health to the affected individual. The case to be reported affords a notable exception to this rule, and is therefore deemed worthy of an extended report by the authors. They beg to offer the record of a case occurring under their observation in which, in a period of time nearly equal to five years after the enucleation of the eyeball, the patient has been in perfect health and in whom no signs of the disease have at any time been noticed: hence the title "Glioma without sequelae."

On the thirty-first of January, 1896, Frances C., aged four years, was brought to the clinic of Dr. Zimmermann, at the Germantown Hospital, because the mother had noticed the presence of a whitish reflex in the girl's right eye, and, although the reflex had been observed for the first time about four months previously, the condition had lately become more marked. The family history was indefinite; the child had had no unusual illnesses but gave evidences of perfect health as was attested by her good color and general development.

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, 15th of January, 1901.

The exterior of the eye was seen to be unaffected, the iris was mobile and the tension of the globe was normal. After dilatation of the pupil a pale dense mass was seen behind the crystalline lens in the lower segment of the ball, with the apex almost reaching to the pupillary edge of the iris. The surface of the mass was free from nodular irregularities, yet the retinal detachment was evidently not due to the fluid collection. The presumptive diagnosis that the case was one of glioma of the retina was made. The probability that the reflex was caused by the presence of a fatally malignant growth was explained to the mother of the child and the removal of the eyeball was advised. The family at this time were unwilling to submit to an operation; the child was kept under observation and in the ensuing five weeks no important changes in the appearance of the intraocular mass were observed.

On the sixth of March it was noticed that a rapid proliferation of the mass had occurred with the formation of nodular extensions into the vitreous, this humor being also transversed by continuous filmy processes—the picture might be likened to the distribution of fragments into the air after an explosion. Immediate removal of the eye was advised as the growth was evidently progressing rapidly. On the thirteenth of March under ether anaesthesia the eye was enucleated without accident; the child made a good recovery and the socket healed perfectly. About two years later the child had a severe attack of diphtheria which she survived and has remained in perfect health ever since. On the twenty-fourth of December, 1900, the girl reported at the clinic when she was seen to be of a large size for her age and in a condition of ruddy health; she wears an artificial eye with comfort and presents an extremely good appearance, while after a period of four years she remains free from any signs of malignant disease.

The jar containing the globe, which had been placed in Müller's solution, was mislaid until early in 1900, when on examination it was found that the tissues had become so deeply dyed by the fluid that they could not be bleached without the solution of their continuity. Under the kind direction of his friend, Dr. Edward A. Shumway, at that time instructor in the laboratory for ophthalmolo-

gic pathology at the Philadelphia Polyclinic and College for Graduates in Medicine, Dr. Chance has made a study of the eyeball and here presents the following report of his examination.

The globe is perfectly smooth and regular in outline though somewhat flattened in its antero-posterior diameter, with no excrescences in the sclera; postoperative changes have taken place in the cornea, through the haziness of which is noticed the rather shallow anterior chamber and the moderately dilated pupil. The optic nerve had been severed at a point about five millimeters behind the globe.

The globe was bisected by an incision made in an oblique direction in order that the apparently greater portion of the tumor mass might be reserved for histologic sections—the museum specimen does not contain the crystalline lens. The tumor mass extends from the ciliary body anteriorly to the porous opticus posteriorly, and is elevated, dome shaped, above the line of the optic axis; no signs of protrusion through the sclera or along the optic nerve are visible. The remaining vitreous cavity is filled with degenerated and compressed vitreous material, while superiorly there is a detachment of the retina and the choroid evidently due to the hardening of the globe.

One hemisphere was mounted in glycerine jelly, whilst the other was hardened and imbedded in celloidin, the sections of this half were stained with hæmatoxylin and eosin; from the prolonged infiltration of the potassium bichromate salts the cellular elements have taken the stains badly.

The corneal changes consist of a marked edema and wide separation of the fibres of the interstitial lamina, detachment of the epithelial layer and by an incompleteness of the membrane of Descemet. The moderately shallow anterior chamber is filled with a granular exudation. The iris is atrophic and presents a widespread round celled infiltration: the vascular coats, especially in the median tunics, are greatly thickened and in many sections the lumen is seen to be filled with leucocytes. The ciliary body is jammed against the sclero-corneal junction and the processes show changes similar to those noted in the iris; the lens is cataractous, the subcapsular cortex being

disintegrated. The posterior chamber has become abolished by the protrusion into it of a granular hemorrhagic exudation.

The retina is detached and is the seat of a marked degeneration. Arising from the inner granular layer is a tumor mass consisting of small round cells with but little intercellular substance, and is pervaded by many small vessels or channels, without distinct walls. The arrangement of the cells about these vascular channels, especially toward the internal periphery of the tumor, much resembles that noted in angiosarcomata. The walls of the channels appear to be formed of compact masses of small round cells which move outwardly become dispersed and finally end in an indefinable granular degenerated mass.

The intercellular substance is granular and scant in amount. While the origin of the mass is mostly confined to the inner layer of the retina, in places the entire membrane is involved and additional foci are apparently scattered throughout the vitreous body. Surrounding the deeply stained masses are dense aggregations of swollen and degenerated granular cells which refuse to take the stains. The minute changes in the cell metamorphosis cannot be differentiated owing to the prolonged hardening which the tumor has undergone. The choroid is more or less atrophic, the blood vessels are filled with masses of polymorphous cells, although the tunics are singularly free from infiltration. To a slight extent, at a no greater depth than the lamina cribrosa, the intraocular end of the optic nerve is infiltrated with the cells which have reached this region by means of the vascular channels; the nerve is apparently not atrophic. No ectasies of the sclera have developed. The diagnosis is that the tumor is a simple circumscribed glioma of the retina.

A CASE OF TUBERCULOSIS OF THE CONJUNCTIVA.

BY DR. HOWARD F. HANSELL,

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On August 18, 1900, a healthy child, three years of age, was brought to my service at the Polyclinic Hospital. His physician told me that for several weeks his right eye had been inflamed. I found on the temporal side of the ocular conjunctiva a partly circumscribed patch of inflammation in the center of which were several small nodules. The appearance of the tumor was somewhat like that of phlyctenule, but its long duration, its site and the character of the injection were such that that diagnosis could not be made. I incised under cocain anesthesia the nodules with the adjoining conjunctiva and closed the wound by sutures. The growth was sent to Dr. Edw. A. Shumway, of the Laboratory of the College who examined it microscopically and submitted the following report: Growth about 3 mm. in diameter. Sections show a central area of necrotic tissue which is surrounded by mononuclear cells and by cells of an epitheloid type, with many giant cells. The growth is covered by thickened conjunctival epithelium, the subconjunctival tissue is hyperemic and infiltrated. A number of sections were stained for tubercle bacilli, but none were found. Despite this fact, in the absence of possibility of animal inoculation, the microscopic findings of a central mass of necrosis surrounded by a zone of inflammatory infiltration with numerous giant cells seems to justify a diagnosis of *tuberculosis of the conjunctiva*.

I have ventured to name this case "Tuberculosis," although I have only the microscopic report upon which to base the diagnosis. I have never seen a case like it, nor have I met with one that was diagnosed "tubercle" either from the clinic or bacteriological standpoint. The peculiar appearance, slow growth and extension correspond clearly to Group No. 2 of Eyre, in Arch. of Ophthal., January, 1900. He says they are "characterized by the pres-

ence of grayish or yellowish subconjunctival nodules varying in size but rarely larger than a hemp seed, resembling the sago granules of acute trachoma when gray, or the tubercles met with in the lungs of acute miliary tuberculosis when yellow is the prevailing tint." He reports 3 cases, in all of which inoculation experiments were made, and in all, the animals died of tuberculosis of various organs of the body about six weeks after the inoculation. In 2 out of 3 cases he found tubercle bacilli. No case should be diagnosed as tuberculosis from the signs and symptoms alone. The discovery of the Koch's bacillus or the successful inoculation, or both together, render the diagnosis absolutely certain, and without them the case is open to other interpretations. If Eyre's claim is correct, that the infection occurs once in 2700 cases, its importance should be recognized and more attention paid to it than is the case at present, especially by American writers. The German and French authors have, in the past two or three years, devoted considerable time to the study and have contributed some valuable papers. Notably, Denig, Arch. f. Augenh. No. 31, 1895; Michel, Arch. f. Augenh. No. 25, 1891; Sattler, *ibid*; Walb, Klin. Monatsb. f. Augenh., 1877; Knapp, Festschrift z. Feier d. 70 Jahr. Geburtst. vom v. Helmholtz; Pregel, Wien. med. Wchnschr., 1893; Stutzer, Beitrage z. Augenh., No. 3, 1898; Mitral'sky, Wien. Klin. Rundsch., 1896; Amiet, Inaug. Dissert., Zurich, 1887; Valude, Ber. d. Ophthal. Gesel., Heidelberg, 1887; Rhein, Klin. Monatsb. f. Augenh., 1898, No. 36; Bach, Arch. f. Augenh., 28, 1894; Fuchs, Leberh. d. Augenh.; Lagrange and Cabannes, Arch. d'Ophthal., July, 1900.

In reviewing this literature I find a general unanimity of opinion as to the methods of diagnosis, the slight stress laid upon the absence of tubercle bacilli in the sections stained, and the great value of inoculation experiments, and the endorsement of excision as the most reliable treatment in preventing relapse and in preserving the other organs of the body from infection.

The data that I have obtained from a perusal of these papers may be briefly summed up as follows:

1. *Cause.* Self-infection such as wiping the eyes with fingers carrying tubercular materials, or by metastasis, or

by traumatism. In a case of Walb, a child one and a-half years old had the conjunctiva and lid torn by striking against a sharp corner. The wound healed and after some time there was swelling and irritation of the eye and the conjunctiva became the seat of miliary tuberculosis. Knapp had a case following squint. Pregel reports one in which a foreign body brought infection into the conjunctiva. Lagrange and Cabannes attribute tuberculosis in the case of a child to a blow on upper and outer corner of left eye from the rib of an umbrella, and shortly afterward the patient was struck in the same spot by a companion's fist. In a few days the eyelid became edematous, the preauricular and submaxillary glands became enlarged and miliary tuberculosis appeared in the palpebral conjunctiva. Microscopic examination revealed the presence of giant cells and tubercle bacilli in the conjunctiva and bacilli in the pus from the glands. The ulcers were curetted and iodoform insufflated. The pus was inoculated into a guinea pig without effect. The eye was apparently cured in two months. The general health was not affected. Mitralsky records 6 cases of infection from contact and from metastasis. Stutzer's case followed the bite of a dog. In three months the lids were swollen and the preauricular glands involved. The child was healthy before the accident, as were his parents, brothers and sisters, although a grandmother died of phthisis.

2. *Site.* The palpebral conjunctiva is invaded far more frequently than conjunctiva of the ball.

3. *Appearances.* (1) One or more small miliary ulcers which usually caseate and that may or may not coalesce; (2) gray or yellow subconjunctival nodules about size of hemp seed and resembling the granules of acute trachoma; (3) hypertrophied papillae and rounded flattened outgrowths of granulation tissues (Eyre and Sattler) usually in fornices; (4) coxcomb excrescences (Eyre and Sattler); (5) pedunculated tumor resembling papilla fibroma (Eyre). In addition Sattler mentions lupus as one of the forms.

4. *Diagnosis.* Sattler excises the tumors or ulcers and divides the section into 3 parts: one for microscopic examination for bacilli, one for inoculation, and one for examination of structures. (In his case—that of the child bitten by the dog—all three sections were found to be tubercular).

The bacilli are not always, indeed, often found. Their absence is not understood to militate against the diagnosis of tuberculosis, but their presence is confirmatory of it. Denig considers, also, that failure of inoculation experiments does not weaken the diagnosis. He lays great emphasis on the confirmatory evidence of tuberculosis of other organs, and in common with some other clinicians believes ocular tuberculosis to be secondary. In view, however, of the cases above alluded to of traumatism that later developed tuberculosis, and of others in which the conjunctival tuberculosis was undoubtedly primary, this view cannot be unqualifiedly accepted.

In this connection a resume of Denig's tables is of interest. Out of 72 cases 52 showed no sign of tuberculosis of other organs; 14 were suspected of hereditary taint; 3 showed evidences previously of tuberculosis in the eye, and 7 in other organs; 10 cases relapsed some years after, as follows: 1, purulent tubercular glands of cheek and nose; 1, lupus of conjunctiva, cheek and nose; 4, phthisis; fulminatis 1, meningitis; 1, miliary tubercle. In 86 cases of tuberculosis of uveal tract, 67 had no sign of tuberculosis elsewhere, 40 were absolutely healthy, 27 suspicious, and 4 had earlier tuberculosis. The eyes were enucleated and 39 heard from, one to eleven years later. Of these 9 died of tuberculosis, proving either that radical operation (enucleation) is not sufficient to cure, or that the ocular tuberculosis was secondary, or that removal of the primary seat of the disease was not sufficient means to conquer the disposition to tuberculosis.

5. *Complications.* Many cases are undoubtedly masked by trachoma, and others are diagnosed as trachoma that are tuberculosis. Each attributes the mistake to the resemblance between granulation and tubercle and to their predilection for the same part of the conjunctiva, and to the similar cicatricial changes. In advanced cases the preauricular glands frequently become the seat of chronic inflammation and later of caseous degeneration.

6. *Microscopic Findings.* Dr. Shumway's report on my case reflects the conditions usually prevailing when bacilli are not found; namely, central mass of necrosis surrounded by zone of inflammatory infiltration with nu-

merous giant cells, marked accumulation of leucocytes at periphery of the section. The discovery of bacilli is confirmatory. In their absence, and in the failure of inoculation experiments, the anatomical changes are sufficiently positive to establish diagnosis.

7. *Treatment.* The two methods that have received the strongest endorsement are excision and the galvano-cautery. The inflamed section of the conjunctiva and a healthy zone surrounding it should be excised where the case is not operable. If the preauricular or other glands are involved, they should be included in the operation. If the case has gone beyond the operable stage, the ulcers should be burned by the galvano-cautery.

CLINICAL NOTES ON SIX CASES OF ALBUMINURIC RETINITIS.

BY ALBERT RUFUS BAKER, M. D.,

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A careful observation of the pathological processes which can be seen in the retina from day to day, in cases of Bright's disease, will reveal some of a transient character that might elude the most careful observer, and some so great as to attract the attention of the most superficial examiner. Among these the most characteristic are neuro-retinitis, numerous small hemorrhages, the characteristic white degenerative patches, and thickening and occlusion of the walls of the blood vessels. In most cases of albuminuric retinitis all these lesions are present and make up a picture so characteristic that it would be almost impossible to mistake it for anything else. It might be mistaken by the superficial examiner for an intense neuritis or choked disc which is present in brain tumor. An examination of the entire fundus oculi ought to differentiate this condition without difficulty.

I have the pleasure of presenting to you a drawing made from a case in which a diagnosis of choked disc had been made, and an examination of the nerve head alone might lead to this conclusion, but a more careful examination of the entire fundus shows the characteristic lesions of Bright's disease. This patient died within a few weeks after the drawing was made. The autopsy revealed a large white kidney. This patient suffered from intense headaches and the diagnosis of brain tumor was made perhaps from this symptom. Previously he was admitted to the Cleveland General Hospital on account of digestive disturbances, and it was proposed to make a gastroenterostomy. He was, however, discharged without an operation and returned some months later with the condition of the fundus of the eye as shown in the illus-

tration. It was found that large doses of iodid of potash would relieve the headaches when everything else failed. One of the most distressing features of this disease from the oculists point of view is that of a bad prognosis. A collective investigation of this subject made by Dr. Belt of Washington, D. C., led him to conclude that the average length of life after the discovery of Bright's retinitis was something less than 18 months. A similar conclusion was arrived at by an investigation made by



the British Ophthalmological Society. While it is true that most cases die within two years there are exceptions to this rule.

I have at present under observation in the city two patients, in one of whom it has been fifteen years since the retinitis was first observed, and in the other about eleven years. In the first case that of Mrs. M., I first treated her for intense headaches twenty years ago. About fifteen years ago she came to my office for spectacles. I discovered a typical Bright's retina, and sent her to Dr. Ashmun for

treatment. During several years I had her under observation I could tell about how much albumen there was in the urine by the condition of the retina. Under a careful hygienic and dietetic regime she finally recovered and no trace of retinitis could be seen. About seven or eight years ago she suffered from hemiplegia, was wheeled about the streets in a chair for some months and then recovered. A year or two later she developed great swelling of the feet and anasarca. I was called to see her in great haste one night and found an edema of the larynx which promised an almost immediately fatal termination. Scarification of the epiglottis and vigorous catharsis soon gave relief. About a year ago she developed mental disturbance and is now in Northern Ohio Hospital for the Insane.

The other case, that of Mr. B., an inmate of the Montefiore Home, came under my observation with a typical Bright's retinitis about eleven years ago. I presented the patient a number of years since, to the Cleveland Society of Medical Sciences as a typical case of Bright's retinitis without albuminuria. He has been under my observation almost ever since, at times there has been a slight albuminuria, but at no time any large quantity. He has for years had more or less edema of the ankles and over the tibia and under the eyes. Six or seven years ago he suffered from an embolism of the central artery of the retina of the left eye. About two years ago a cataract formed rapidly on this blind eye, and in the past few months a cataract has developed on the right eye. Since writing the above I have extracted the lens from this eye. There have been no untoward symptoms, and the visual results are very satisfactory, while albuminuria is a source of anxiety it has not in my experience contra-indicated cataract extraction even in severe cases.

Such cases as the above are exceptional ones. These patients not infrequently come to the office for spectacles without any thought of suffering from serious disease. A typical case was that of late Dr. Kinnaman, a member of this society. He came into my office one day and said that he thought he was old enough to wear glasses; I found that he had a Bright's retina. When I told him what I had found he was much surprised and said there

was not a healthier doctor in Cleveland than himself, but before he left the office I examined his urine and found it loaded with albumen. He died in less than nine months from this time.

Another patient sent me by Dr. Morton four months ago died yesterday. She was a beautiful, strong, robust appearing eighteen year old girl; graduated from high school last June. She was sent to me on account of headaches, hoping these would be relieved by glasses, but I found a typical Bright's retina and was not at all surprised to see a notice of her death in the papers this morning.

The prognosis in the retinitis of scarlatina and of pregnancy is much better than of other forms of the disease. I am decidedly of the opinion in the case of pregnancy in which retinitis develops that a miscarriage should be induced notwithstanding one case in which I urged it my advice was disregarded and the patient is still living and well, and has since given birth to two healthy children, but she had a narrow escape. She suffered for three days from eclampsia such as I hope never to witness again. The case was under the care of an eminent surgeon, and I repeatedly urged him to bring about a miscarriage which he declined to do. I was called in an emergency one night to see her and found her suffering from convulsions. I then insisted on delivery but two or three consultants that were called in decided to wait. At the end of three days she miscarried and finally recovered. Although this was about fifteen years ago she is still living and well, and as I said above, has since had two healthy children.

Another case in which my advice was disregarded the woman became totally blind although she gave birth to a healthy child at full term. About four years later she became pregnant again and died in convulsions.

THE SURGICAL TREATMENT OF ENTROPION AND TRICHIASIS.

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The marvelous progress of surgery within the present generation has created an almost morbid appetite for the new, the strange and the wonderful, which results in the neglect of less exciting literature. We grow impatient of an attempt to study what has been done in the past, but as we have neither absorbed nor inherited the knowledge of our forefathers it is no waste of time to study their writings, in which we will only too often find the latest operation described together with a serious presentation of its faults. Until we make our knowledge include the learning of the past we shall continue to have the same operations brought forward from time to time as original, lauded perhaps, and again relegated to oblivion. Of course a certain number of patients must pay the penalty of the failure on the part of the latest discoverer to know the facts in regard to the operation.

By entropion is meant a turning in of the edge of the lid: by trichiasis a distortion in the direction and arrangement of the lashes so that they irritate the eyeball: by distichiasis a double row of lashes. The term distichiasis should be reserved for cases in which the presence of a double row of lashes is congenital, because when it is the result of a pathological condition it is in reality an accidental form of trichiasis and should be known as such.

Two varieties of entropion are recognized, the spastic and the cicatricial. The spastic form is that in which a lax condition of the skin renders it unequal to the task of making a normal resistance to a certain degree of contraction of the fibres of the orbicularis about the edge of the lid, or in which a diminution in size or a loss of the eyeball is the predisposing cause. It affects the lower lid almost exclu-

sively and is not the result of a pathological condition of the edge of the lid. Cicatricial entropion may be caused by burns or other injuries of the conjunctival surface of the lid, or by local disease, preeminently trachoma. This condition is characterized by a change in the form of the inner edge of the free margin of the lid, a sharp bend of the cartilage backward near its free border, and the production of trichiasis. Rarely trichiasis may be met with as an independent affection, not associated with inversion of the lid, but in the majority of cases it appears as one of the characteristic conditions present in entropion. To avoid confusion the pathological condition which the surgical procedures here considered were intended to ameliorate will be called simply entropion.

The history of the operative treatment of entropion abounds in frequent recurrences of the same operation, sometimes with important or unimportant modifications, but often differing in nothing except the language of description. The operations have been applied indiscriminately to the spastic and cicatricial varieties, despite the fact that the etiological factors are for the most part different and that the problems presented do not usually admit of the same solution. Thus Hippocrates' suture, modified by Gaillard and Rau, was at one time much used in cases of cicatricial entropion, where it proved incompetent, and was again brought forward by Square for use in the spastic form where it is frequently perfectly competent. Snellen proposed his thread operation for entropion of the upper lid, in which it rarely proved useful, Gillet de Grandmont practically modified this and carefully confined its application to spastic entropion, and then Dransart extended its sphere of action to include again trachomatous or cicatricial entropion. Therefore it is impossible to confine the historical account of the several operations under the heading of either variety, although it is necessary to bear in mind the distinction and to study the individual need when any particular case seeks relief.

When the lashes rub upon and irritate the eye it is natural to seek relief through their removal, and the simplest, as well as probably the most ancient, way is *epilation*, or pulling them out. As this rarely destroys the root it is seldom more than a palliative measure, but it must fre-

quently be performed. Considerable patience and skill are needed for its proper performance in many cases because the offending lash is often so small and colorless that it can with difficulty be seen with the aid of oblique illumination and a magnifying glass, and when seen slips easily from the grasp of the forceps. To remove the lashes permanently the most heroic methods have been employed.

According to Harlan¹⁴ the ancient Egyptians destroyed the hairbulbs and the margins of the lids by *cauterization with red-hot plates of gold*, and are said to have performed this operation on the healthy lids of children as a prophylactic measure. Celsus² *seared the roots of the lashes with a large, thick, red-hot needle* passed deeply along the edge of the lid from one canthus to the other. Puncture of the roots of the lashes with red-hot needles, as performed by Pare, Solera, St. Yves and others, was effective, but produced slight deformities of the lids, sometimes with deviation of previously normal lashes. Galvano-puncture as practised by Carron du Villards in 1837¹⁴ and Samelsohn in 1873³⁷ was a great improvement, but was quickly surpassed by *electrolysis*, introduced in 1879 by Michel³⁸ of St. Louis and applied in this manner. The point of a triangular gilt or platinum needle attached to the negative pole of a constant battery of from eight to twenty elements is pushed beside the lash into the follicle, an electrode attached to the positive pole is placed on the temple and the current is closed. A minute froth appears around the needle and after the lapse of a number of seconds proportioned to the strength of the current it is withdrawn. The lash may come away with the needle, or it may easily be pulled out, but if it is yet firmly in place the operation should be repeated at once as the bulb has not been destroyed.

According to Galen,⁷ Antonius Musa used a paste of alum and vitriol for this purpose, but most of the ancient writers leave the reader in doubt whether they used caustics for this purpose or to burn the skin of the lid. James Hunter¹⁵ punctured the bulb of the offending lash and, when dried, inserted powdered antimony tartrate. Williams¹⁸ in 1861 removed the lash and then plunged into the follicle a platinum needle which had been dipped in caustic potash.

In 1825 Vacca Berlinghieri⁸ recommended to *turn back*

a narrow flap of skin so as to expose the bulbs of the distorted lashes and then to extirpate them with the knife or with nitric acid. In 1844 Wilde¹⁶ performed a similar operation and applied silver nitrate to the roots of the affected lashes. Manolescu³² in 1891 proposed to split the edge of the lid so that the roots of the distorted lashes would be in the posterior leaf and then to touch them with a red-hot iron.

Strangulation of the roots of the lashes was proposed by Herzenstein²⁰ in 1866. He surrounded them subcutaneously on all sides, except in the intermarginal space, with a thread which he tied and allowed it to cut its way out.

The excision of the entire ciliary margin of the lid, "scalping", was first suggested by Rhases according to some authors, but Guthrie refers to De Re Medica, Liber IX, cap XXVI, and states that Rhases directed that the tarsus be cut in inveterate cases of trichiasis without telling how it was to be done. Bartisch in 1583 removed the margin of the lid from one end to the other throughout its whole thickness, an operation apparently the same as that proposed by Gerdy³⁹ in 1854. Jaeger⁷ incised the skin a line above the lashes from one canthus to the other down to the cartilage, passing above but as close as possible to the roots, seized the temporal end of the ciliary edge of the wound with toothed forceps and removed its entire length. He left the wound open, Wilde brought the edges together with fine sutures. Flarer¹¹ improved this operation by making the first incision along the mouths of the Meibomian ducts and then the incision through the skin of the lid. Any operation of this kind which involves the removal of a portion of the margin of the lid is apt to leave the eye subject to epiphora, because the margin is no longer able to guide the tears. To avoid this Stellwag¹² excised the outer edge of the margin and replaced it in a reversed position. An operation which involves the removal of all or a great part of the lashes leaves the lid in a badly deformed condition, deprives the eye of the protection of the lashes as well as of the physiological action of the margin of the lid and can hardly be expected to improve the cosmetic appearance of the patient. It should rarely be employed, although it

may occasionally be the best means of caring for a scanty row of twisted lashes growing from a badly deformed lid-margin. When the faulty lashes are few in number and the rest of the margin of the lid is in good condition electrolysis is the best means of removing them.

To correct the course of a misdirected lash by conducting it through a new track in the skin of the margin of the lid, an operation known as "*illaqueatio*," is so simple a procedure and one which promises to be so effective that it was resorted to in ancient times and its originator has been forgotten. It has been ascribed to Celsus, but he described it² as one which had been performed by others and did not meet with his approval because of the prolonged torture, the danger of inflammation and its inefficiency. The method was the same as that attributed by Himly to Avicenna:¹⁰ a needle carrying a loop of a woman's hair is passed through the skin of the edge of the lid, the lash is caught in the loop and drawn through. Replace the words "woman's hair" with the words "silk thread" and the operation is that suggested by Snellen⁴⁰ in 1862 and Schulek³³ in 1871. When the needle is in place the lash may be threaded into its eye, but this is scarcely more of a modification than the substitution of silk for hair. The correct explanation of the inefficiency of this operation is probably that given by Stellwag¹² from the investigations of Donders²³ and Maehli,³² who found that the life of a lash is only 150 days, and, as only tolerably well grown hairs can be treated in this manner, the effect cannot last for even that length of time, as the succeeding lash usually does not follow the new track.

Certain operations have been devised with special reference to the *distortion of the cartilage* which is found in cicatricial entropion. About the beginning of this century Saunders⁶ removed it entirely. Berlin¹¹ removed a portion 2 or 3 mm. broad from one end to the other. This seems to be exactly the same as Limbourg's operation,⁴⁴ and not very different from that of Nicati,⁵⁴ who excised the upper part of the cartilage from the conjunctival surface and then sutured the insertion of the levator palpebrae to the remains. McCraith⁵⁸ took away a slip of cartilage less than 1/12 of a line broad, an operation which amounted to little more than a horizontal division of the cartilage.

Excision of the whole or a great part of the cartilage is apt to cause lagophthalmos as well as injury to the Meibomian glands and hair bulbs.

The unique operation devised by Von Graefe²⁵ in 1864 may be described here as it involved the loss of a part of the cartilage. He first excised a triangle of skin with its base parallel to the ciliary border and as long as the extent of the affected lashes. On the lower lid he drew the margins of the skin near the apex together with two or three sutures. On the upper lid he excised within the bared space a smaller triangle from the whole thickness of the cartilage down to the conjunctiva with its base along the upper border and its apex near the lid margin. The edges of skin were united with sutures, the middle one of which included the tissue of the cartilage. Canthoplasty was usually performed in addition.

To relieve the blepharophimosis Ware suggested a *vertical division of the lid*, an operation performed by Guerin,²⁶ Richter, Plenck¹⁰ and Beclard.⁷ Schreger⁷ excised a triangular piece of the lid and so removed the trichiasis, but left a great deformity. Crampton^{7, 8} made two vertical incisions through the lid, one at each end of the affected portion, everted the included part and retained it thus with a mechanical appliance. Guthrie⁷ modified this operation by avoiding the canaliculus, adding the removal of a portion of the skin of the lid and using the sutures required to close the wound to act as the suspensory by attaching them to the brow with plaster. Whether the entropion was ever cured or not by suspension the patient was invariably disfigured for life, the continuity of the margins of the lids was destroyed and various troubles of the eye supervened.

In 1858 Streetfeild¹⁷ proposed his famous operation. "An incision with a scalpel is made of the desired length, just through the skin along the palpebral margin, at a distance of a line or less, so as to expose, but not divide, the roots of the lashes; just beyond them the incision is continued down to the cartilage (the extremities of this wound are inclined toward the edge of the lid). A second incision, further from the lid margin, is made down to the cartilage at the distance of a line or more from the first and joining it at both extremities. These two incisions are then continued deeply into the cartilage, obliquely toward each

other. With a pair of forceps the strip to be excised is seized and detached with a scalpel. No plaster or sutures are used as it is not desired to obtain primary union." According to this description Streatfeild made the groove as closely as possible to the free margin without cutting the roots of the lashes and not about the middle of the cartilage as seems to be the idea held by some operators.

The first modification of this operation was proposed by Snellen who closed the wound with three sutures, each armed with two needles, one of which was introduced into the upper part of the cartilage so as to emerge at the upper margin of the groove and both then carried through the skin just above the lashes and secured there with beads. Pfalz²⁸ incised the conjunctiva for 6 mm. in the middle of the wound in the cartilage and introduced five sutures through the skin and muscles above the wound, out of the cartilage above the groove, then downward and backward to emerge behind the lashes. The sutures were tied, one end of each cut short, the other fastened to the brow with a plaster. Herbert³⁰ passed three sutures from behind the lashes upward and forward to be brought out immediately above the lower margin of the skin wound, then into the anterior surface of the upper piece of the cartilage above the groove, and brought out again after taking a firm hold without involving skin or muscle. Masselon³³ in 1893 laid bare the cartilage, thinned it by ablation of its anterior surface, and then bent it by means of three sutures joining the upper and lower parts of the cartilage only.

Much ingenuity has been expended on the invention of *mechanical appliances* to withdraw the misdirected lashes from the irritated eye, some of which are valuable in spastic entropion though of little or no use in cicatricial. According to Galen⁷ Heraclidus fastened the lashes to the surface of the lid with adhesive plasters. Aetius³ mentions but does not commend the use of glue for this purpose. Jacob²¹ substituted collodion for glue to mat the lashes together and bind them down to the skin for two or three weeks. A very different suggestion was that of Bowman⁷³ and Batten,⁷⁴ who recommended the application of collodion to the skin of the lid in order to involve the latter in its contraction as it dried, and so pull upon the

edge of the lid. The advantages of this procedure in spastic entropion are that it is painless, is not injurious to the tissues of the lid, is sometimes sufficient for the permanent relief of the condition and when unable to effect a permanent cure can give relief for an indefinite time until some other method can conveniently be employed. According to Guthrie, Rhases invented a forceps for compressing a fold of the skin of the lid and so to cause the eversion of its edge. This idea was readvocated by Bartsch, Goyrand and Nelaton⁶² and Bonnafont,⁷⁷ each author usually preferring a forceps of his own device. Janin¹⁰ claimed that he had cured entropion by daily pinching the skin of the lid with forceps. Sichel⁷⁹ claimed to have obtained the same result by having the patient press with his fingers just below the lower border of the orbit for some little time every quarter of an hour. Fabricius⁴ in 1620 recommended to attach to the brow a plaster to which a thread had been tied, to the upper lid a similar plaster and to tie the threads together so as to make sufficient traction to turn the edge of the lid. Scultetus¹⁰ passed threads through the skin of the upper lid and fastened them above the brow with plaster. Ware¹⁰ drew the skin of the upper lid upward and pressed it against the margin of the orbit with a compress and bandage. Milles²⁰ commends the following: Take a piece of fairly thick, soft lead wire, mold it to the face commencing from the centre of the forehead, bringing it half way down the middle of the nose, thence at right angles along its side and just below the lower lid to the prominence of the malar bone; again at right angles and now parallel to the first part to the front of the temple. Strap the two ends of the wire firmly to the forehead and apply a bandage over the strapping. A little manipulation of the wire to the extent of lightly indenting the skin just within the lower orbital ridge will keep the lid everted. McKeown⁸¹ reported a case of spastic entropion cured by suturing the lids together for six days. Goldzieher⁸⁴ proposed to support the edge of the lid by means of an ingenious mechanical contrivance applied to the conjunctival surface of the lid.

In the consideration of the treatment of spastic entropion, it should be borne in mind that in some cases the lid will readjust itself if the irritation which is the cause of

the spasmodic contraction of the orbicularis is removed. Thus can be explained the permanent good results ascribed to the employment of any of the above means, but if the tension of the skin is inadequate to maintain the balance of power over the orbicularis after the removal of the source of irritation, none of these methods will prove of more than temporary benefit. A case came under my own observation in which the normal position of the lower lid had been maintained for a year by frequent application of flexible collodion to the skin, but in which the entropion immediately recurred as soon as the application was discontinued, although there was no irritation of the eye nor blepharospasm. In such cases the maintenance of the margin of the lid in a normal position may be sought through measures to increase the tension of the skin, so as to offer a sufficient resistance to the action of the orbicularis, or through interference with the action of the muscle itself. The former has been the means commonly employed since the days of Hippocrates, while the latter does not appear to have been used until the present century.

The operation of Hippocrates,⁷ historically the oldest known, is to pass a *ligature through a fold of skin* by means of a needle, tie and allow it to suppurate out. According to Himly this was practiced by Wardrop, but it obtained its greatest prominence from the recommendation of Gaillard⁴⁶ to lift up a fold of the skin of the lid, pass *two* needles, each armed with a strong thread, through its base, one near each canthus, tie the ends of each thread together had allow them to suppurate out. In 1855 Rau²² added a third suture between the other two. Arlt¹¹ made the sutures two in number, but placed them at the junctions of the middle with the outer and inner thirds, and returned the threads through the base of the fold before he tied them. In 1863 Pagenstecher⁴¹ modified this operation by the addition of a canthotomy. Williams⁸⁷ introduced three ligatures through a fold of the skin of the lid, but, although this was accepted as a new operation by Warlomont,⁸⁴ I am unable to appreciate any material difference between it and the operations of Hippocrates, Gaillard and Rau. Finally in 1881 Square⁸⁰ brought forward as an original procedure in spastic entropion, which

he thought hardly worthy the name of operation, the exact method of Hippocrates, and in the following year Pargamin⁸⁸ reported the employment of "Square's operation." In spastic entropion this operation is often sufficient, but is open to two objections, it is apt to cause some deformity and the final effect can with difficulty be estimated. Pargamin's case illustrates the uncertainty as to the amount of interference necessary in any particular case—the patient had spastic entropion of both lower lids, Hippocrates' operation was successfully performed on one, the other returned to its normal position without interference. This operation has been tried many times in cicatricial entropion, but with little or no success.

At the Congress at Heidelberg in 1868 von Graefe described a method said to be very ancient, in which the edge of the lid is everted by tying together with sufficient tightness two threads, each attached to a fold of the skin, one near the margin of the lid, the other near the margin of the orbit.

In 1862 Snellen⁴⁰ proposed a method which became well known. The lid was everted and two needles carrying a single thread were passed directly through so that one pierced the cartilage just below its upper border, the other the tissues just above. The lid was then replaced, the needles re-entered in the apertures they had made in the skin, conducted along the outer surface of the cartilage, brought out through the skin just above the lashes about 2 mm. apart and the ends of the thread tied. A slight and at best a temporary benefit is all that can be obtained in this manner. In 1888 Allport⁸⁹ suggested for mild forms of entropion to pass a needle with a strong silk thread through the lid from the outside midway between the canthi just below the upper boundary of the cartilage, then to pass it back through the lid two lines away and to tie the ends tightly. His object was to obtain an inflammatory adhesion between the tip of the cartilage and the tissues anterior to it and so cause the lashes to turn out, but it is difficult to understand how permanent benefit could accrue from it in a case of cicatricial entropion and hence, as spastic entropion of the upper lid is rare, this operation is seldom applicable. A similar operation was suggested by Gillet de Grandmont⁹¹ in 1889 for use in functional or

spastic entropion of the lower lid and was called by him "*horizontal ligatures*". He used three threads each armed with two needles. The two needles of the first thread were introduced in the fundus of the inferior cul-de-sac 6 or 8 mm. apart, pierced the lid and emerged 3 or 4 mm. apart 3 or 4 mm. from the edge of the lid where the ends of the thread were tightly tied. The other sutures were inserted in the same manner and when tied formed a little sulcus in the skin of the lid which resembled one which is normally present in old people. These sutures are claimed to correct the entropion in proper cases, but Dransart³⁴ attempted to apply them to the correction of cicatricial entropion of the upper lid with the result that he almost exactly reproduced Snellen's operation.

Jaesche³⁴ proposed to correct entropion of the lower lid by passing a strong "11" thread subcutaneously except at two points about a quadrilateral involving most of the lower lid, removing an oval piece of the skin within this quadrilateral, and then tightening the threads so as to close the wound and evert the lid by the ligation of the subcutaneous tissue.

With regard to the use of ligatures in any of the above ways it should be noted that they are applicable in the same class of cases as the mechanical appliances just described, because they act practically in the same manner, by increasing the tension of the skin in opposition to the contraction of the orbicularis, or by attaching with a slight degree of firmness the edge of the lid to a more or less fixed support. The latter principle is capable of development into the most effective method of dealing with cicatricial entropion, but ligatures form too weak an attachment for permanent benefit in such cases.

Interference with the action of the orbicularis was first distinctly proposed by Key⁷⁵ in 1825, who excised the muscle after laying it bare through an incision in the skin, an operation which, with some minor changes in technique, was commended by Green in 1898. Cunier⁶¹ divided the muscle with a tenotome introduced beneath the skin at the level of the bony margin of the orbit, while Heidenreich¹³ preferred to introduce the tenotome near the free border of the lid, but subcutaneous myotomy has been

superseded by canthotomy, usually with division of the palpebral ligament. Von Ammon⁹⁵ seems to have been the first to perform canthotomy for this condition, but since that time various canthoplastic operations have been suggested, notably by Busch,²⁴ Noyes⁹ Wharton Jones,⁸ Schelske⁹⁷ and Fernandez.⁵⁶ In 1898 Risley⁵⁰ recommended an operation which is almost identical with that of Busch. He makes a horizontal incision at the outer canthus, removes a triangle of skin with this incision for its base, its apex pointing downward, and then with a deeply placed suture draws the apex upward and outward and fixes it at the outer end of the first incision. The purpose is to correct the position of the lid by traction in a line parallel to the lower border of the cartilage without distortion of the ciliary border of the lid. Schelske's is a very complex operation to produce about the same result. Fernandez incises the external commissure, detaches the upper lid for the height of a cm., places beneath it a short flap detached from the temple and reunites the commissure. Stellwag¹² in his advocacy of what he termed "*oblique blepharotomy*," division of the entire thickness of the lid obliquely downward and outward, or upward and outward, near the outer canthus, refers thus to canthotomy: A horizontal section along the line of the palpebral fissure can never do this work. It does not interfere with the elastic tension of the tarso-orbital fascia, does not rob the muscular fibres inserted into the anterior surface of the tarsal ligament of their external point of fixation and therefore not of their activity in inverting the lid. But when the cut is made obliquely through the entire thickness of the lid these bundles of fibres are separated from their lateral insertions and can contract without resistance. In the operation brought forward by Agnew in 1875 and known as "*cantholysis*" the advantages of oblique blepharotomy are secured without so much danger of disfigurement. The tissues at the outer canthus are divided horizontally with a strong pair of scissors, the lid is made tense, the points of a smaller pair of scissors are passed vertically into the wound, one blade on each side of the palpebral ligament which is then divided. The cut edge of skin and conjunctiva are then united with sutures.

Destruction of a portion of the skin of the lid with *caustics*

to produce a cicatricial contraction and so turn the lashes away from the eyeball is accredited by Peschel³⁷ to Hippocrates, Celsus and Ab ul Kasem; the use of the actual cautery for the same purpose he ascribes to Celsus and Ab ul Kasem. Himly¹⁰ also says that Celsus and Ab ul Kasem used the *actual cautery* for this purpose and that the latter employed a mixture of soap and quick lime, a caustic referred to by Paul of Aegina as well known. It seems to me that these authors are in error in regard to Celsus and that he used the cautery to remove offending lashes rather than to shorten the skin, but, though I have been unable to verify the other references, it is certain that these methods are of ancient date. They are sometimes spoken of as obsolete, but have been advocated in quite recent literature.

In 1724 Cotunnus⁷ advocated the application of caustic potash to the skin of the lid, some years later Callisen used nitric acid and Helling⁷ in 1815 sulphuric acid in the same manner. In 1898 Theobald⁵⁰ again urged the application of caustic potash to the skin of the lower lid in senile entropion. He says: "In applying the caustic our aim should be to produce an eschar 3 to 4 mm. in width, parallel with the lid margin and extending the whole length of the tarsus. At no point should the action of the caustic be allowed to approach nearer the margin of the lid than 1 1/2 to 2 mm. and as the destruction of tissue tends to spread considerably beyond the actual point of contact of the crayon, the line of application of the latter should be about 4 mm. from the ciliary border. Along this line, the lid meanwhile being everted and kept well upon the stretch, the crayon should be drawn back and forth several times, until the epidermis is destroyed and the tissues beneath begin to assume a brownish color. Holding the lid carefully so that it shall not become inverted, the action of the caustic is allowed to extend as far as may seem desirable, when it should be arrested quickly by the application of an acid solution." A serious objection to this use of caustics is that it is difficult to gauge their application so as to secure the exact amount of cicatricial contraction desired.

It is claimed by Gotti⁷² that the first to use the *galvano-cautery* to shorten the skin of the lid was Magni, who, in

the early part of 1875, by this means corrected an entropion caused by a burn. Routier and Arnozan⁷² say that the thermo-cautery was first used for this purpose by Cusco in 1876. The use of one of these methods is held in high esteem by Dehenne,⁷³ Thillier,⁷⁴ Peschel³⁷ and Querenghi.⁷² The therapeutic superiority of the thermo- and galvanocautery to the red-hot iron lies in the fact that they can be applied more accurately and delicately to the tissues, and those who favor this method agree that the cauterization must penetrate through the tissues to the cartilage, must be done very evenly, and to an extent to be determined by the surgeon in each case. Thillier directs to make a linear incision of all the tissues down to the cartilage with the thermo-cautery at a red heat, parallel to and 2 mm. from the free border of the lid. He says that if no bridle is left the surgeon will see the trichiasis correct itself instantly, especially in the lower lid.

Because he found cauterization of the skin of the lid to be so inefficient Bromfield⁵ laid bare the levator at its insertion, drawing aside the fibres of the orbicularis, and applied the cautery there. He acknowledged that though the trichiasis was cured the lid was shortened more than he could wish. According to Peschel,³⁷ Scellingo and Galezowski in 1877 performed a similar operation, but burned the subcutaneous tissue and the upper face of the cartilage with the thermo-cautery.

An attempt to correct cicatricial entropion by this method as urged by Peschel, Querenghi and others is an error. The benefit obtained by the use of caustics or the cautery is due to the formation of an anchorage of the extensible tissues of the lid so that through them sufficient traction may be made on the outer edge of the margin of the lid to maintain it in its normal position by the superficial contraction of the cicatrix. This may be more than ample in spastic entropion but insufficient in cicatricial, and then the presence of such a cicatrix may interfere with the performance of any other operation.

Excision of a piece of skin from the lid has been handed down as a standard operation since the days of Celsus, Aetius and other ancient writers and has been performed sometimes with success, more often without. The failures were not due to a faulty method of removing the flap of

skin, as claimed by Mackenzie,⁸ but to the fact that the skin of the lid is easily stretched and loosely attached to the subjacent tissue so that the traction of the margin of the lid produced by the operation is quite transitory. Szokalski³⁰ recognized this and in 1872 tried to meet the indication in cases of spastic entropion of the lower lid by the production of a broad subcutaneous cicatrix. He dissected up almost all the skin of the lower lid so as to form a quadrilateral flap, cut from the lower edge of this a piece of skin of such size as he judged to be best, and sutured the lower edge of the flap to the lower edge of the wound. The results of this operation are said to have been good, and they probably always will be in the class of cases for which it was intended. Thomalla⁸⁵ sought the same end in another way. He excised a fold of skin and inserted two sutures, fastened the lower end of each to the malar bone with collodion, drew upon the upper ends until the outer edge of the lid margin was everted and then fastened them beside the other ends in the same manner. By this means the wound was closed and the upper skin flap drawn downward, while the lower flap is not drawn upward as it is when the wound is closed in the usual way. The lower margin of the orbit has been utilized as a firm point of attachment for the skin of the lower lid by Waldhauer,³⁶ Gruening⁵⁰ and Noyes.⁵⁰ Waldhauer made an incision through the periosteum from the outer canthus to the exit of the infraorbital nerve, scraped the bone slightly at the margin of the orbit, removed a crescentic flap of skin and closed the wound with sutures passed through the margin of the cartilage and the periosteum at the scraped place on the bone. The cartilage thus became attached to the bone and furnished a firm basis for traction.

Noyes removes a narrow strip of skin and then carries deep sutures into the oculo-orbital tissues, grazing the edge of the orbit. Gruening's method is very similar except that he does not sacrifice any skin. He dissects up the skin of the lid after making an incision 4 or 5 mm. from its free border, and then introduces three sutures through the lower flap, the tarso-orbital fascia and the upper flap. Schneller²⁷ instead of excising the horizontal fold of skin included between two elliptical incisions, left it in place and united the edges of skin over it. His idea was that

the buried piece of skin would act as a wedge, press the cartilage inward, push down the lower part and draw down the upper part of the skin of the lid, but the operation failed to accomplish all its author expected. In a case of entropion of the lower lid Noyes⁴⁹ dissected up a narrow strip of skin which was left attached at its temporal extremity, closed the wound with sutures, removed a portion of the flap and fastened its free end to a bared space very near the outer canthus, so as to make the flap draw upon the outer edge of the lid. Four years later he removed the flap. In 1890 E. Jaesche¹¹⁶ seems to have returned to the primitive removal of a skin flap after he had designed a forceps to be applied to the upper lid and guide the scalpel in marking out the flap. Finally in 1898 Guerin⁵⁰ claimed that he had obtained good results in many cases of spastic entropion from the excision of a narrow strip of skin, fascia and muscle 1 mm. from the lashes without the use of sutures or closure of the wound.

The excision of *vertical strips* of skin as practised by Janson⁸ and Foucher¹⁰⁰ give little, if any, better results than are usually obtained from excision of horizontal folds and leaves a much more unsightly scar.

Aetius quotes the following operation and credits it to Leonidas:³ Mark out where to excise a fold of skin from the lid. Evert the lid and make an incision from one end of it to the other just inside of the abnormal hairs. If necessary make two incisions, one at the site of the abnormal hairs, the other internally to them. Excise the fold of skin previously marked out and close the wound with sutures. In entropion of the lower lid simply excise a fold of skin. Celsus¹ advises that a piece of skin neither too large nor too small be excised from the lid and a linear incision be made under the roots of the lashes that being raised from parts below the lashes may point upward. "In superiore palpebra sub pilis ipsis incidenda linea est, ut ab inferiore parte diducti pili sursum spectent." He adds that this incision alone may suffice for the cure if the entropion is slight and that it is not needed in entropion of the lower lid. Harlan¹⁴ refers to the Tetrabibli of Aetius and states that the context shows that "subsectionem intrinsecus faciamus" refers to an incision including the cartilage. The ancient writers were not as minutely definite in de-

tails of their descriptions as some modern writers, and I am not aware that any of them stated how deep he made this incision, but from the fact that Celsus states that in mild cases the incision may suffice for a cure it may reasonably be inferred that it was as deep as other surgeons have found it necessary to make it to obtain the same result. Celsus' operation appears to have been identical with Ammon's "*tarsotomia longitudinalis*"¹¹ and with the operation named for Von Burow⁹⁶, who divided the cartilage along a line seen on eversion of the lid 2 or 3 mm. behind the inner margin of the lid, and, when needed, excised a fold of skin. After such a section of the cartilage Trantas⁹³ recommended to evert the edge of the lid with a loop of silk passed through the conjunctiva above the cartilage, between the cartilage and skin almost to the lashes, brought out, re-entered two mm. away, returned in a course parallel to that in which it came until it emerged near its point of entrance where it was tied. Lagleyze⁵⁷ introduced six needles, carrying three sutures through the conjunctival surface of the everted lid, on a level with the upper border of the cartilage, passed them between the cartilage and the skin and brought their points out through the skin above the lashes. Leaving the needles thus in the lid he made an incision through the conjunctiva and cartilage down to them. He then brought the needles out and tied the suture. Scott¹⁰² performed tarsotomy, everted the margin of the lid and fastened it in position with silver wire. Green's operation⁴⁸ differs little from Celsus' except in the manner of introduction of sutures. "Make an incision parallel to and 2 mm. from the row of the openings of the ducts of the Meibomian glands, carried through the entire thickness of the tarsus, and should extend in complete entropion from near the inner to the outer canthus. This separates the entire lid margin from the body of the tarsus and permits it to be easily everted and held in a new position. Excise a strip of skin 1 1/2 to 2 mm. wide, tapering to a point at each end, its lower boundary 1 1/2 mm. above the line of the eyelashes. Only skin and adherent connective tissue should be removed, leaving the orbicularis fascia and muscle intact." In placing the sutures "the needle is first introduced a little to the conjunctival side of the row of eyelashes and brought out just

within the wound made by the excision of the strip of skin; it is then drawn through, inserted again in the wound near its upper margin and passed deeply backward and upward so as to graze the front of the tarsus and emerge through the skin of the eyelid 1 cm. or more above its point of entrance." Collodion was applied after the sutures were removed. Coggin¹⁰⁸ omitted the excision of a fold of skin and fastened the lashes to the skin of the lid with collodion.

The most important advance in surgery of cicatricial entropion in modern times was made by Anagnostakis⁶³ in 1857, when he pointed out that a true correction of an entropion must be secured through constant tension between a fixed point in the lid itself and the margin of the lid, which must not extend to the surrounding parts. The upper edge of the cartilage forms a fixed point in the lid and the desired tension may be obtained through the skin. He made an incision through the skin about 3 mm. above and parallel to the margin of the lid, excised some of the fibres of the orbicularis over the upper part of the cartilage, and then sutured the lower edge of the skin to the upper margin of the cartilage. The sutures were left to suppurate out and the wound to heal by granulation. Although Warlomont⁶⁵ in 1874 as a step in his operation removed some of the fibres of the orbicularis and sutured the upper margin of the detached band of tissue to a fold of fibrous tissue above the cartilage, the value of the principle enunciated by Anagnostakis was not perceived until reiterated by Hotz¹⁰⁶ in 1879. Hotz's operation is to make an incision along the upper margin of the cartilage from one commissure to the other, turn down the skin so as to expose the orbicularis, remove a strip of this muscle 3 mm. wide from one end of the cut to the other and then to pass four sutures entered 2 mm. from the margin of the lower lip of the incision, through the aponeurosis on the upper third of the cartilage upward a little above the junction of the tarso-orbital fascia and out through the skin of the upper lip of the wound, so that the skin is pulled down and attached to the cartilage. Later⁴² he presented this amplification:—After the removal of the strip of the orbicularis he dissected the rest of that muscle together with the skin from over the rest of the cartilage

down to the roots of the lashes and excised a wedge from the cartilage, using the forefinger of his left hand as a spatula to protect the eye and to guide in making the incisions, but still later¹¹⁹ he abandoned the grooving of the tarsus and now when the simple operation is insufficient he prefers to make an incision behind the lashes and fill the triangular gap thus formed with a skin graft from behind the ear. The operation described by Thompson⁴⁶ is Hotz's without modification. In 1888 Panas¹¹⁰ described an operation which he denominated a combination of Aetius' and Anagnostakis'. He made an incision parallel to and 2 or 3 mm. from the free border of the lid down to the cartilage, dissected the flaps up and down until the cartilage was laid bare, performed a tarsotomy if the cartilage was deformed, and sutured the lower flap to the tarso-orbital fascia. Mueller's operation³⁵, which purported to be a modification of Panas', was really a rotation of the ciliary margin and does not belong to this class of operations. Pagenstecher²⁹ modified Hotz's operation by making the incision in the skin 1/2 mm. lower down, penetrating to the cartilage in its middle only, at each end involving the skin alone, laying bare the tarso-orbital fascia for 3 or 4 mm. above the cartilage, introducing the sutures through the skin and muscle of the lower flap about 1 mm. above the lashes, bringing it out on the inner surface of the lower margin of the wound and then passing it through a fold of tarso-orbital fascia and levator 2 or 3 mm. above the cartilage. Schnabel¹¹¹ made two incisions down to the cartilage, one 1 mm. above the lashes, the other 3 mm. above the first, removed the strip of muscle between them and closed the wound with five to eight sutures. the needles passed first through the upper margin of the wound in the skin and muscle, then into and out of the cartilage and then below the narrow strip of skin above the lashes to come out close beneath the latter. Chronis⁴³ employed a different technique from any of the above named operators and added a horizontal traction of the edge of the lid. He first performed canthotomy, then made an incision through the skin alone parallel to the margin of the lid and a short distance from the lashes till it joined the incision made by the canthotomy, dissected the skin upward, excised all the orbicularis over the cartilage and

cut away a portion of the cartilage proportional to its thickness. Then he inserted two sutures at the outer canthus, one from within outward through the lip of the wound in the upper lid thence to the apex of the triangle made by the canthotomy, the other in a similar way in the lower lid, thus drawing the edges of the lids outward and then passed six or seven sutures through the margin of the wound next the lashes to traverse horizontally the tissue over the cartilage. Next he made an incision 1 mm. deep behind the lashes along the line of the openings of the Meibomian ducts for the length of the lid. The ends of the sutures were drawn tightly so as to hold the lid erect and fastened above the brow with plaster. The operation described by Webster¹¹² is Green's operation with the addition of partial excision of the orbicularis and attachment of the lower skin flap to the exposed cartilage. An incision is made through the conjunctiva and cartilage about a line from the free border of the lid for its whole length, then an incision through the skin a sixth of an inch from the margin and parallel to it, another 2 or 3 lines above this and the intervening strip of skin is removed. The orbicularis is then seized in three places, in the middle and midway between this and each end of the wound, and removed so that the cartilage is bared in three places. Sutures are inserted in each of these places by passing the needle through the skin below from without inward, through the upper border of the exposed cartilage, through the skin flap above and are then tied.

In all operations where an incision is made through the cartilage for its whole length and traction made on the outer edge of the margin of the lid there is a certain amount of *rotation* and it may be transplantation of the margin upward, if the incision is at a sufficiently oblique angle, but the first surgeon to distinctly propose these was the elder Jaesche. His brother states³¹ that the operation was published first in the *Medicinischen Zeitung Russlands* in 1844 and later in other Journals, and calls attention to the differences between it and Arlt's operation, with which it has been frequently confounded. An incision was made for a greater distance than the extent of the trichiasis $1/4$ to one line behind the lashes; a semilunar flap of skin 5 or 6 lines broad was removed from the lid;

a bistoury was then passed through from the first incision to the lower border of the skin wound and a cut made for its whole length so that the margin was separated from the rest of the lid except at its two ends. This narrow bridge of skin and hair bulbs was then drawn upward on the cartilage, a movement which caused it to rotate so that the lashes pointed outward, and secured in this position by suturing the cut edges of skin together. Rotation of the margin has since been adopted as the basis of two other operations, Evans⁷⁶ and Mueller's³⁵. Evans split the edge of the cartilage to the depth of 4 mm., made an incision through the skin 3 or 4 mm. above and parallel to the lashes, exposed the cartilage and made an incision into it so as to meet the first. The lashes were thus placed in a wedge shaped piece of tissue separated from the rest of the lid except at its ends, with its edge pointing upward. This wedge was then rotated until its edge pointed downward and inward so as to be in contact with the globe, and secured in this position by closure of the skin wound. Mueller, in an attempt to modify Panas' operation laid the cartilage bare, divided it horizontally and introduced two needles carrying a single thread into the anterior surface of the upper piece of cartilage, brought them out through the cut surface and then passed them from before backward through the lower piece of cartilage and tied the thread on the conjunctival surface, which caused the edge of the lid to rotate 90°, and fastened it to the cut surface of the upper piece of cartilage.

Arlt's modification of Jaesche's operation,¹¹ commonly known as the *Jaesche-Arlt*, was to split the lid at its margin into two layers and to abandon the separation of the ciliary flap from the rest of the lid. A Snellen's clamp was applied to the lid and an incision made between the lashes and the openings of the Meibomian ducts 5 mm. deep, so as to divide the margin of the lid into two layers, the anterior containing the skin, muscle and hairbulbs, the posterior the cartilage, Meibomian glands and conjunctiva. A skin flap was then marked out by two incisions, one parallel to and 5 to 7 mm. from the margin of the lid, the other arching upward from one end of this incision to the other. The included portion of skin was removed without injury to the orbicularis and by then closing this

wound with sutures the part of the skin carrying the lashes and their bulbs was drawn up on the anterior surface of the cartilage and fastened. Snellen¹¹⁷ recommended to make an intermarginal incision 2 mm. deep, a horizontal incision through the skin 4 mm. above the lashes, to expose the cartilage and cut through it at an angle of 35° so that the lower portion could slide up over the upper, and then to draw it up by three sutures passing from just behind the lashes through the lower skin flap, the upper border of the cartilage and the tendon of the levator. Von Graefe²⁵ split the lid as in Arlt's operation, made a vertical incision four lines long at each end of the part to be transplanted, pushed the flap thus formed upward and fastened it with sutures. The superficial resemblance between this and Crampton's operation was noticeable and it is said to have been hardly less disfiguring. Warlomont¹⁴ modified the Jaesche-Arlt operation by removing some of the fibres of the orbicularis and suturing the upper margin of the flap to be transplanted to a fold of fibrous tissue above the cartilage. The operation described by Thompson¹¹³ and credited to Brailey seems to be identical with Warlomont's. Germaix⁹² bared the cartilage for a height of 6 or 7 mm. through an intermarginal incision, destroyed the lower hair bulbs with the galvano-cautery, excised a crescentic flap of skin and muscle so as to expose the tarso-orbital fascia to which he sutured the lower edge of the skin wound. Harlan¹⁴ splits the lid margin, removes a strip of skin 4 mm. above the lashes, together with a narrow band of muscular fibres. "The sutures are passed through the free edge of the cartilage and conjunctiva (the posterior lip of the split margin), over the roots of the lashes and under the muscle at the upper edge of the wound. When they are tied the strip containing the cilia is strongly tilted forward and its cut edge is crowded into the groove in the muscle, where it unites." De Wecker¹¹⁸ performed canthotomy, sutured the cut edges of conjunctiva and skin, split the lid by an intermarginal incision, drew up the skin and secured it by means of four or five Gaillard's sutures. This operation differs very slightly from the operation performed by Levis, according to Harlan¹⁴ which is apparently the same as that of Grandelement,⁷¹ who split the lid to the depth of 3 to 6 mm. separating the anterior layer cleanly from the

cartilage, folded the skin of the lid so as to transplant the lashes as much as desired, and maintained it in this condition by one or more threads passed through the base of the fold.

A serious objection to the Jaesche-Arlt operation is that the margin of the lid whence the lashes have been transplanted upward is left to granulate and leaves a discolored and deformed condition. To obviate this Jaesche³³ in 1881 covered the raw surface with a thin layer of epidermis (Thiersch grafts), a procedure later advocated by Schroeder and Natanson¹¹⁴ and by Gifford.⁹⁰ The latter modified the intermarginal incision by adding to it at each end a cut 1/2 cm. long at an angle of 45°.

The reconstruction of the margin of the lid by means of grafts was first suggested by Spencer Watson¹⁹ in 1873. He formed a narrow flap which included the faulty lashes with their bulbs and a strip of cartilage and dissected it up until it was attached to the lid only at the canthus. Above and adjacent to this he made a narrow skin flap with its base in the opposite direction and then sutured the first flap in the place whence the second had been taken and the second in the place of the first. In 1893 the author acknowledged what several writers had claimed, that this operation was not very good when the faulty lashes were in the middle of the lid, and brought forward another intended for this class of cases.⁵¹ By two incisions, one above the other below the faulty lashes, he formed a bridge of tissue adherent only at its ends, containing the lashes with their bulbs. Immediately above this he marked out an oval "button" by a curved incision through the skin and orbicularis down to the cartilage and passed it below the bridge of tissue so as to occupy the place of the lower incision. According to Truc and Villard,⁷⁰ Junge in 1876 modified Watson's operation by first making an intermarginal incision as in the Jaesche-Arlt, a horizontal incision about 3 mm. above the margin from one canthus to the other, another parallel incision of the same length 3 mm. above, dissected up the skin between these so as to form a bridge attached at each end, divided vertically at each end of the intermarginal incision all the tissue between it and the lower border of the flap, drew the flap or bridge down below the quadrilateral carrying the lashes and secured it in

position. Burchardt's operation⁸³ seems to be identical with that of Junge, and both to differ from Von Graefe's almost wholly in the application of the skin graft about the margins of the transplanted quadrilateral. Gayet⁸⁶ covered the space left by an intermarginal incision with a flap of skin from the lid adherent only at the inner canthus. A little later Dianoux⁸⁷ published his method, which was to include the lashes and their bulbs in a flap of tissue adherent only at its ends, form a longer flap from the skin of the lid immediately above, also attached at each end, draw the latter down beneath the former which in turn was shoved up and sutured to the cartilage. Dor¹¹⁵ modified Dianoux' operation by dissecting up a quadrilateral flap above the lashes, drawing it down beneath the flap formed from the ciliary margin, cutting off the portion needed to fill the intermarginal incision and maintaining the new relations with metallic sutures. Stellwag¹² removed the flap containing the lashes, turned it end for end and replaced it. Jacobson⁸² filled the space left by an intermarginal incision with a pedicled flap taken from any available part of the skin of the face or lid. Minney¹⁰⁹ by non-pedicled grafts behind the ear or the trochanteric region of the forearm. Vossius,⁴⁷ Smith,¹⁰⁷ Wicherkiewicz,⁹⁸ Panas,⁵⁵ Thier⁸⁸ and others have presented modifications until it seems as though every possible variation has been made as to the site whence grafts might be obtained, in the use of one or more, pedicled and non-pedicled, as well as in the manner of their attachment. An operation which combines a number of the methods yet considered without marked dependence on any one, was published by Knapp¹⁰⁴ in 1896. Ordinary canthoplasty, incision of the intermarginal space, curved incision of the skin 3 or 4 mm. above the ciliary border, removal of a small strip of muscle along this incision, grooving of the tarsus, passing 4 or 5 sutures through the lower lip of the wound, the upper edge of the tarsus and the skin of the upper lip: detaching from the upper lip of the wound with a straight pair of scissors a strip of skin 1.5 mm. broad and as long as the intermarginal incision, into which it is to be implanted, tying the skin tarsus sutures and implanting the skin in the gaping incision. In regard to the implantation of skin grafts it has been demonstrated that unless the flap is taken from

a portion of the skin which contains absolutely no hair bulbs the fine hairs which are normally found over most parts of the body are apt to continue to grow and maintain the irritation of the cornea which occasioned the operation; hair bulbs are also apt to be overlooked during the operation, to reassert themselves by sending lashes through or beside the graft and so to render the operation nugatory; faults so serious that when they occur the operation is a failure.

To avoid the growth of little hairs from the surface of the grafts Van Millingen¹⁰¹ proposed to take them from the mucous membrane of the lip. Originally he split the margin of the lid, but later adopted the method described in the *Ophthalmic Record* for 1898. A line is traced with the point of a knife from one end of the intermarginal space to the other, cutting in the middle line and avoiding the lashes, which must be left above. Then a number of cuts are made in the tissue underlying the first incision, with the knife held obliquely, so as to widen the wound without grooving or cleaving the lid. "The success of the operation depends greatly on the form given the wound surface, which must be flat throughout, not over 2 mm. wide and must not be lozenge shaped." Insert three sutures first through a fold of skin close to the brow, then through another fold near the lashes and tie firmly enough to keep the lid drawn up without causing too much ectropion. "Seize with a forceps a thin fold of mucous membrane on the inner surface of the lower lip, just where it begins to present the appearance of mucous membrane, and remove a strip 15 mm. long by 2 wide. This is easily done if the operator starts with the angle of the branches of the scissors and not the point. The strip is laid on a plate of glass and any fatty or knotty tissue excised. The sides should be pared down to the size and shape of the wound, should be thin, even throughout and semitransparent." Story¹⁰³ followed Van Millingen's original method. Maher¹⁰⁸ divided all the structures of the lid except the skin through an incision $2\frac{1}{2}$ mm. behind the lashes and sutured a graft from the mucous membrane of the lip into the gap thus formed. This is the tarsotomy of Celsus, Ammon or Von Burow without the excision of a fold of skin and the interposition in the wound of a flap of mucous membrane.

The problem in cicatricial entropion is to draw the outer edge of the margin of the lid away from the eyeball, and to retain it permanently in very nearly its normal position. Celsus' operation fulfilled the first indication, that of replacing the edge of the lid in a position approximating the normal, but the permanency of the result was not such as to warrant his confident assertion that it was always successful. With two additions, the anchorage of the lower flap of skin to the upper border of the cartilage to secure permanency, and the implantation of a wedge-shaped graft of mucous membrane to prevent the agglutination of the lips of the wound behind the lashes, Celsus' operation fulfills all the conditions for the correct solution of the problem. A certain amount of variation in detail is advisable in dealing with different cases and surgeons will continue to differ as to the details which go to make up the best possible operation, but all are probably agreed as to essentials. Some surgeons think the implantation of a graft unnecessary, others prefer to use one from the skin,—it may not always be an absolute necessity but it guards against the closure of the wound in a way which would negative any advantage obtained therefrom, and is a finishing touch to the operation which leaves the lid well formed without endangering ultimate success by making it dependent on the chance whether a graft adheres or not. The real progress in the surgery of entropion and trichiasis since the days of Leonidas, or whoever the surgeon may have been who first devised the operation just mentioned as Celsus' and described by him and other ancient writers, is perhaps embodied in these two modifications, for all operations which have attained a considerable degree of popularity, such as the Streatfeild-Snellen, and the Jaesche-Arlt, depend largely on the presence of two or more of the principal features of this operation so modified, the shortening of the lid skin, its anchorage to the cartilage, the partial detachment of the ciliary margin and the reformation of the edge of the lid.

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THREE CASES OF ALCOHOL-TOBACCO AMBLY- OPIA PRESENTING RETINAL HEMORRHAGES.*

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The difficulty of assigning certain conditions and symptoms to one or the other of the two principal causes of amblyopia ex-abusiva rising from the fact that usually the patient is addicted to the excessive use of both toxic agents, is true of the following cases. As in all of them, however, there was a preponderating abuse of the same agent (alcohol) they at least point to this agent being a factor in the production of the exceptional lesion.

Case 1. A. B. Male, aged 49 years, treasurer of an industrial concern, came to me October 22, 1897, complaining of watering of the eyes. He stated that he had had recurring attacks of inflammation in both eyes for the past fifteen years; had worn glasses for near work for the past twelve years; had used tobacco and alcohol to great excess for many years and that he never had had a headache in his life.

In the right eye there was a broad pterygium encroaching two mm. upon the cornea. The reaction of the irides was normal. Both discs were gray. The existing comp. hypermetropic astigmatism was corrected giving a V. = 16/20 in O.D. and 16/16 pt. in O. S. He had little trouble, except for an attack of phlyctenular conjunctivitis, until September of 1898, when he had a return of lacrymation with failing vision; that of O.D. = 16/80 and that of O.S. 16/25. There was no demonstrable scotoma but colors were not distinct between fixation and the blind spot. At this time I removed the pterygium. He returned in January, 1899, with still further diminution of central vision O.D. = 16/80 and O.S. 16/40,

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with the same modification of central color perception. On Feb. 28, 1900. V = 16/180 in each eye. There was slight irregular contraction of the fields for form and red. In the right eye, red was seen as yellow in the central area and in the left eye a color scotoma, 5° in width extended for a distance of twelve degrees outward from fixation. One week later under increased doses of potassium iodide and Strychnia V. in O. S. improved to 16/80. The ophthalmoscope now, for the first time, showed a small striated hemorrhage at the upper, and a linear hemorrhage at the lower margin of the disc in O. D. March 19, 1901; the outer half of both nerves is pallid and the nasal half over-capillary. The upper-inner edge is veiled. Vision of O. D. 16/80 of O. S. 16/40. There is a small central scotoma in O.D., and in O. S. red appears dark at fixation.

This man was incorrigible. He was continually under the influence of liquor, and to such a degree that he returned nightly to his home with a staggering gait. His moral sense had become so blunted that with the odor of the latest infraction of his promise still on his breath he would at each visit inform me, with apparent sincerity, that he had quit using liquor entirely. Owing to his condition at these visits there is no continuous record of the progress of the scotoma.

Case 2. Referred to me by Dr. J. G. Shoemaker of Phoenixville, Pa., on February 13, 1900. J. D., aged 44 years; barber. For the past three or four weeks he has had the classical symptoms of his affection. He uses tobacco to excess and is in a chronic state of alcoholism.

O. D. V = 16/66, O. S. = 16/130. In the right eye there is a broad pterygium encroaching one mm. onto the cornea. Dr. Shoemaker reports knee-jerks exaggerated; no organic disease of the heart and urine normal. Ophthalmoscopic examination: O. D. A vacuole in the anterior cortex above the centre. Disc round and over capillary. Sharp cut central excavation. Broad striated hemorrhage in the retina extending for one and one-fourth disc's diameter from the edge of the disc over the inferior temporary artery and vein. Veins dark and distended, especially the inferior temporal at the site of the extravasation.

O.S. Media clear, disc round and over-capillary. A striated hemorrhage in the retina about two disc's diameters

up and out just at a branching of the vein. For the right eye the field of vision for form and color was nearly normal. There was an oval scotoma for red extending from 5° on the nasal side of fixation to 15° on the temporal side. In the left eye the field for form and color was slightly contracted and there was a scotoma for red extending 5° on the nasal side of fixation to 18° on the temporal side. It extended 2° below and 5° above the horizontal meridian. Along the upper edge for a breadth of 3° red was seen as yellow.

One week later, Feb. 20, a small hemorrhage was present at the edge of the excavation where a small branch was given off from the superior vein. It was triangular in shape, being very narrow until it reached the retina where it broadened out and became striated. The left eye was unchanged. Vision of O. D. = 16/40 and of O. S. 16/80. In the right eye the scotoma had lifted at fixation but extended farther below the horizontal meridian at the blind spot. In the left eye the scotoma had divided into two 4° islets, one at fixation, the other 10° from fixation, and all over the area previously blind for red that color was seen as yellow.

One week, subsequently, Feb. 27, the hemorrhage in O. D. had almost absorbed and in O. S. there was no evidence of hemorrhage. Vision in O.D. = 16/30; O.S. 16/86. The field for O. D. had changed but little; in that of O. S. the outer islet was now included in red as yellow area.

March 9. There were a few reddish striae at the upper margin of the disc and in the position of the above described hemorrhage up and in, there were two brilliant crystals.

April 13. The outer half of each nerve was gray. There was no scotoma and V. = O. D. 16/20 partly; O. S. 16/20 full.

Case 3. L. M., aged 44 years, shoedealer, was first seen Feb. 21, 1901. He first noticed five weeks ago, that his vision for near and far was becoming foggy, and that it was relatively worse for distance. He is in good health but his appetite is capricious. Has never had grippe. Smokes his pipe almost continuously from 10 to 12 at night. Drinks about twelve large whiskies a day. Kneejerks exaggerated. Urine normal. The reaction of the irides normal.

In the right eye the media were clear, disc vertically oval and gray in its temporal half with veiling of the upper-inner edge. Scleral ring broad to the nasal and temporal sides. There was a striated hemorrhage in the retina extending from the lower-outer margin of the disc for half a disc's diameter, overlying inferior temporal artery. In the left eye there was a round macule just below the centre of the cornea. The disc was over-capillary in the nasal half and pallid in the temporal half. Its upper-inner edge was veiled. There were no hemorrhages.

Vision of O.D. = 16/80 and that of O.S. 16/66, not improved by a glass.

In the right eye the peripheral field was normal. There was a scotoma for red divided by an islet of about three degrees in which red could still be made out. The fixation scotoma was about 13° in length, 5° of which extended to the nasal side.

In the left eye the peripheral field was normal but there was a narrow oval color scotoma extending from 5° to the inner side of fixation to 5° to the outer side of the blind spot.

March 11. In O.D. the scotoma was now entirely para-central and in O.S. red was now seen as yellow at fixation.

March 19. In O.D. very faint hemorrhagic striae down and out. Vision of O.D. 16/66 and of O.S. 16/40.

In all three instances the hemorrhages were found in the fibre-layer of the retina in the vicinity of the disc and usually overlying a vessel.

In all I have been able to find recorded 20 cases in which retinal hemorrhages were noted in intoxication Amblyopia. Seven of these are contributed by Uhthoff, all occurring in alcoholics six of whom were subject to epileptic convulsions and to this complication was attributed the occurrence of the hemorrhages. Nettleship records 4 cases, one in an intemperate, one in a user of tobacco and alcohol but who recovered without abstaining from alcohol, and one in a person who had been a teetotaler for ten years. Stanford Morton's patient used tobacco to excess. Belt's case was seen in a man with multiple neuritis who was recovering from an attack of delirium tremens. Ammann has seen several instances in which, with a more or less well defined evidence of intoxication

amblyopia, small retinal hemorrhages could be seen situated principally about the papilla and usually overlying a vessel. Haab in his article on "Diseases in the Circulatory System," in the Norris and Oliver "System of Diseases of the Eye," states that he "has seen other examples of such hemorrhages, and besides (but not in senile patients), has found spindle-shaped irregularities in the columns of blood in the arteries and veins, which pointed almost certainly to a microscopic thickening of the vessel walls". My own cases were of the mixed type in which the abuse of alcohol was in excess of that of tobacco.

Analysis shows that of the above 17 cases in which I find notes as to the toxic agent used in excess, in 13 instances it was alcohol and if we include the other six cases of Uhthoff, (and I believe there is good reason for so doing as I can find no authority for considering retinal hemorrhage an ophthalmoscopic finding in epilepsy and as later evidence shows that they do occur in toxic amblyopia, although they might occur as the result of a neuritis in these cases) we have 19 out of the 23.

Ammann remarks that "it has long been known that lead poisoning, gout and especially alcoholism lead to sclerosis of the vessels but that it could reach a degree sufficient to lead to hemorrhages is noteworthy and demonstrates clearly the destructive action of alcohol." He states that the influence of tobacco in producing these changes could not be demonstrated as in not one of his cases was this agent alone used. Sachs has found in cases of toxic amblyopia "proliferating endophlebitis, a periphlebitis, a choking of the peripheral capillaries and small extravasations from them". Uhthoff, 13th Inter Med. Cong. has stated that in intoxication amblyopia he had found that anatomically beside the purely atrophic changes, an interstitial neuritis; and de Schweinitz has said that "The changes produced by alcohol in the smaller blood-vessels might permit an exudation from these blood vessels causing a transient edema," so that clinically and pathologically considered it is probable that the hemorrhages result from the giving way of the alcoholically diseased vessel walls under the increased intravascular tension caused by the pressure of the inflamed nerve fibres.

HEMORRHAGE OF THE RETINA.

BY G. GRIFFIN LEWIS, M. D.

SYRACUSE, N. Y.

ILLUSTRATED.

Mr. W. J. G., a well built man of 46, with good family history and no specific or alcoholic taint, first consulted me on May 17, 1897, complaining of blurred vision. At that time vision had been entirely gone in the right eye nearly two years. He gave the following history: In September, 1894, his right eye suddenly became partially blind and upon consulting a prominent oculist he was told that he had a retinal hemorrhage, which was confined to the right eye and due to Bright's disease. This was the first ocular manifestation of his nephritis. Notwithstanding an early and vigorous treatment, the retina remained permanently damaged and this was followed later by the development of a cataract which rendered the organ practically useless. The left eye had a vision of 18/20 and with a + .25 s. $\odot$ + 1.00 c. ax 180° of 18/15. For reading he accepted an additional + 2.25 S. I prescribed the lenses which relieved him greatly, but as he still had a large amount of albumen in his urine, I advised him to consult his family physician, Dr. H. N. Eddy, of Geneva, N. Y., under whose care he had been more or less since the fall of 1896, at which time, the doctor informs me, his urine contained 30 per cent. of albumen, by bulk, hyaline and granular casts. On October 31, 1897, six months later, he again consulted me. This time for an iritis of the right eye and a rapidly developing goitre. The urine still contained 30 per cent. of albumen and he was once more referred to Dr. Eddy for general treatment. Almost immediately he began to amend. The goitre disappearing with the iritis. Just here, I would like to state that I have had several cases with ocular lesions brought about by albuminuria where goitre was also a complication which disappeared with the eye trouble.

Seven months later, on May 30, 1898, the patient called

again, this time complaining of dimness of vision in the left eye and the red appearance of objects. Vision was 18/70 and the ophthalmoscope confirmed my suspicions of a retinal hemorrhage, springing apparently from upper nasal branch of the central artery, within the margin of the optic disc. I prescribed pilocarpine, pressure bandage and rest. On June 4, four days after the appearance of the hemorrhage, vision had gone from 18/70 to 18/30, on June 15, to 18/20 and on June 29, to 18/15. Thus there was complete

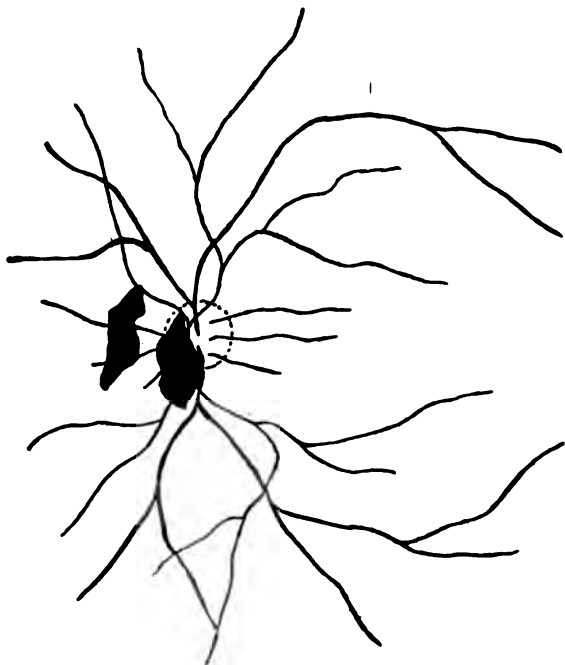


Fig. 1.

absorption of the blood clot with perfect restoration of the parts in one month.

On September 17, of the same year, three months after the first hemorrhage in the left eye, he came to me with another one in the same eye. It came on during the night without any premonitory symptoms whatever, his attention being called to it upon arising by the extremely poor vision and the red appearance of everything. After dilating his pupil with cocaine, the ophthalmoscopic picture which met my eyes was decidedly interesting. The nasal half of the disc and a somewhat smaller area out-

side of the disc and to the nasal side were covered by two large dark red extravasations of blood, irregular in shape, which to all appearances sprang from the same vessel as the previous hemorrhage and spread out between the retina and the hyaloid membrane. The uncovered part of the disc was free from congestion or cloudiness and its margin was perfectly clear. There was no turbidity of the retinal tissue surrounding the hemorrhage. The veins were not tortuous and the arteries were not small or collapsed but gave evidence of distinct circulation, a condition unusual in such cases. Tension was somewhat increased, no lesion could be detected in the region of the macula excepting that it was a trifle darker in color than it had previously been, but central vision was gone, while peripheral vision was intact as objects when held to one side could be seen fairly well and did not have a red appearance.

Fig. 1 will fairly well illustrate the appearance of the fundus at that time. Vision was only 18/200. I immediately prescribed a saline cathartic (Epsom salts), pilocarpine hydrochlorate $\frac{1}{8}$ grain three times a day, a pressure bandage and absolute rest, having the patient sleep in a sitting posture, warning him against stooping or exerting himself in any way. Later I gave him potassium iodide and codein tablets.

On the 22nd, five days later, vision had gone from 18/200 to 18/50, ophthalmoscopic examination showed the clot to be paler in color and smaller in size. On the 29th, twelve days after the occurrence of hemorrhage, vision was 18/15 although absorption was not complete until several weeks later.

On June 27, 1899, I changed his distance glasses to + 50 s. $\odot$ + 1.25 c. ax. 180° with an additional + 3.00 s. for reading, and since that time he has used his eye regularly and mostly by artificial light (as he is a night operator in a telegraph office) without any inconvenience whatever. During this time, he has had repeated analysis of his urine made, invariably reporting the presence of albumen and casts, though not in such amounts as during the existence of the ocular lesion.

The last time I saw the patient was on September 20th last at which time his complexion, weight and general

health were better than they had been in five years. (Weight had increased 15 pounds during the last six months.) He had been attending regularly to his business but was extremely cautious about his diet, etc. Vision was 18/15, the color sense normal, tension normal and the fundus to all appearances normal, but the visual field was very much contracted excepting on the nasal side. There was no visible trace of exudation left, no atrophy of the papilla and no degeneration or pigmentation of the retina. There is no doubt but that in many cases the hemorrhage is primary and the retinitis secondary, the latter being due to the irritation of the retinal fibers caused by

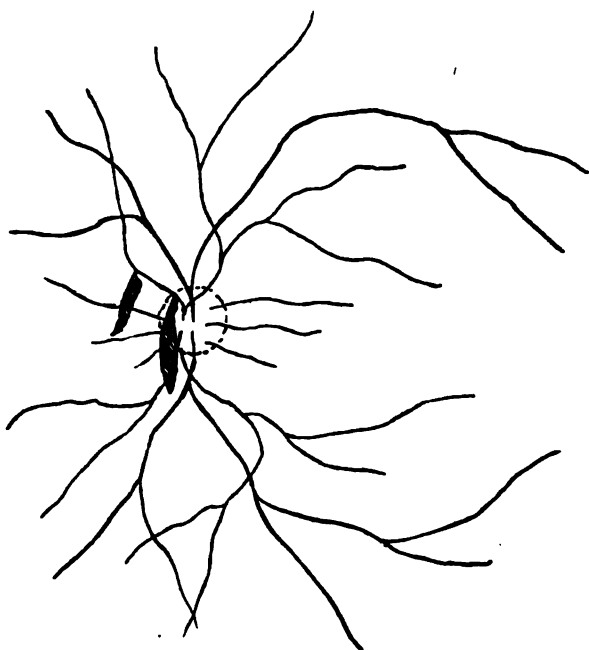


Fig. 2.

the presence of the former. In my case retinitis and its dire results were in all probability prevented by the rapid absorption of the blood clot which did not interfere long enough with the function of the retina for secondary changes to take place.

I report this case, not because apoplexy of the retina is of rare occurrence, for it is not, but rather because of

the many unusual features which it presents. In the first place, there was no involvement of tissue surrounding the blood clot, such as congestion of the papilla, turbidity of the retinal tissue or changes in the calibre of the blood vessels, a condition which is not only unusual but quite surprising considering the size and source of the hemorrhage. Secondly, because of the exceedingly short time in which complete absorption took place, about one month in each instance. Fuchs says, "Absorption in these cases is very slow, requiring from weeks to months." Noyes says: "From one to twelve months and perhaps longer will be required for the completion of the recuperative process," and Daguenet says, "Vision may be restored in from six months to a year."

Thirdly, because of the perfect result without any degeneration or atrophy of retinal or nerve tissue.

Fourthly, because of the difference in the present visual field as compared with that which existed during the presence of the blood clot. At that time, although the region of the macula was very little if any involved, central vision was entirely gone and peripheral vision intact, while to-day, peripheral vision is gone and central vision is intact.

Lastly, because of the present condition of the patient which is the best it has been for five years.

Renal hemorrhage of the eye usually occurs in the terminal stage of contracted kidneys and most patients die within two years after the ocular lesion takes place. The prolongation of life to the end of the fifth or sixth year is exceedingly rare. Dr. Belt's statistics taken from private practice on the prognostic value of albuminuric retinitis shows that 62 per cent. of the cases die within one year from the occurrence of the retinal trouble; 85 per cent. die within two years and only 15 per cent. live over that time. Such perfect results are frequent after the albuminuric retinitis of pregnancy but unusual in chronic Bright's disease.

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

BY

CHARLES H. MAY, M. D.,

NEW YORK,

AND

JULIUS WOLFF, M. D.,

NEW YORK.

(Quarter Ending June 30, 1901.)

On the Operative Treatment of Corneal Astigmatism.

BREUER, A., London. (*The Lancet*, June 1, 1901.) The writer calls attention to the well known changes in curvature of the cornea following operations, such as cataract, iridectomy, etc. He refers to the attempts to cure astigmatism by corneal incisions with the keratome or with Graefe's knife, the incisions being made at one or both ends of the meridian of stronger refraction; in some of these cases, the astigmatism became less and even disappeared completely. He reviews the results of experiments in this direction, both with incisions and with the galvano-cautery.

During the last three years, the writer noted the refraction of the cornea in the visual line in the two principal meridians before and after any operation, by means of Javal's ophthalmometer, and found that corneal incisions made in the vertical meridian lessened the refraction of that meridian and increased that of the opposite meridian. If the incision is made in the limbus or a little further peripherially, the effect is small; the more the incision approaches the center of the cornea, the greater the effect. He measured the curvature of the cornea not only in its visual center, but in points 5°, 10° and 15° distant from it along the principal meridians, representing these measurements by a curve as suggested by Sulzer.

The writer gives the history of a case of simple glaucoma and of a case of high myopia, stating the refraction before and after operation. He then introduces the report of five cases which were operated upon for corneal astigmatism with the following remarks:

"It is well known that by far the greater part of astigmatism is under normal conditions due to faulty curvature of the cornea. Astigmatism caused by irregular contraction of the ciliary muscle has never been proved. Any plan, however, to cure astigmatism by perforating corneal incisions based on experience gained by other operations seems to me to be wholly unjustifiable on account of the danger involved with any perforating wound. Incidental experiences when cauterizing a corneal ulcer or infiltration induced me to try galvano-caustic. I employed the ordinary loop of fine platinum wire, presenting at its tip a surface of about one millimetre. The instrument is connected with the electric main (alternating current) by a transformer and a rheostat. Dull red heat was employed. A small punctiform burn was effected in the limbus or in the cornea, penetrating to about one-half of the corneal thickness. The small operation was performed under local (cocain—holocain) anesthesia. In some cases I found it advisable to mark the point chosen for cauterization by a small superficial abrasion and subsequent staining with fluorescein. The marking was done while the patient looked at a distant (five metres) object straight in front of him in the horizontal plane, so as to obviate torsion movement of the eyeball. The cauterization itself lasted from two to three seconds. The effect was in all cases exactly the reverse of what took place by incision. The following case will illustrate this."

Case 3 was an example of hyperopic astigmatism of 3.5 D. in a young girl. Punctiform cauterization was made in the horizontal meridian at two places about one and a half millimeters distant from the outer and the inner limbus respectively, followed by instillations of homatropin, bathing the eye with warm boric acid lotion, and a monocular bandage for two days, the operation was done under cocain. Two days after the operation the horizontal meridian showed a considerable increase of refraction, the vertical one showing a diminution of lesser extent—

the changes being exactly the reverse of those after corneal incision. Six weeks after the operation the astigmatism was reduced to 1.50 D.

"As in incisions, the immediate effect decreases after a short time, but a permanent result is always left. The immediate effects of the operation as well as its decrease afterward are, however, very much greater than in the case of incisions. It will be noticed later that this decrease is not so marked in adults. Owing to the great increase in refraction of the operated meridian and the slight decrease of the one perpendicular to it, the eye becomes necessarily more myopic—i. e., less hypermetropic. The left eye of the same patient presents changes very similar after the operation."

In this case, the little girl who "before the operation was obliged to wear glasses always, uses them now for near work only. Another slight cauterization performed three months later has removed the remaining astigmatism and the refraction of both eyes is now + 2.0 D. sph. $\left. \begin{array}{l} \text{V. R.} \\ \text{V. L.} \end{array} \right\} = \frac{6}{9} + 1.5 = \frac{6}{6}."$

Case 4, mixed astigmatism; before operation (punctiform cauterization at both ends of the horizontal meridian of the cornea) V. R. = $\frac{6}{36}$; w. + 1. D. sph. $\ominus$ — 3.0 cyl. hor. = $\frac{6}{12}$; three months after operation, V. R. = $\frac{6}{12}$; w. — 1. D. cyl. hor. = $\frac{6}{9}$. Left eye, before operation, V. = $\frac{6}{12}$; w. + 0.75 D. sph. $\ominus$ — 1.5 D. cyl. hor. = $\frac{6}{9}$; four months after operation, V = $\frac{6}{6}$ w. — 0.5 D. cyl. hor.

Case 5, compound hyperopic astigmatism was one of the rare cases in which the astigmatism (2 D.) was not due to abnormal curvature of the cornea. The operation decreased the curvature of the horizontal meridian, increasing it in the vertical; there was afterward a corneal astigmatism of 2.5 D; total-astigmatism, none.

Case 6, myopic astigmatism, woman of 30; both eyes, = $\frac{6}{12}$; $\frac{6}{6}$ w. — 1.00 D. cyl. hor. One month after cauterization of both corneae at one point in the horizontal meridian one millimeter from the temporal limbus, the refraction was — 0.5 D. sph., and the patient was quite comfortable without any glasses.

Case 7, mixed astigmatism, axis oblique, man of 60: V. L. = $\frac{6}{36}$; w. + 3.0 D. sph. $\ominus$ — 4.0 D. cyl. 30° = $\frac{6}{12}$.

Three weeks after punctiform cauterization of the cornea at both ends of 30° meridian, 2 mm. from the limbus, V. L. = $\frac{6}{13}$; w. + 1.0 D. sph. = $\frac{6}{9}$.

"Ten other cases operated upon by me in the same manner showed very similar results. The cauterization would invariably heal in from one to two days. About three weeks after the operation the scar could be detected only by a very close inspection or by focal illumination. I selected only those cases for operation in which there was a reasonable chance that the patient could do without glasses afterward. Therefore the operation is limited to cases of compound hypermetropic and mixed astigmatisms. The best results are obtained in the former cases, the patients losing their astigmatism and becoming less hypermetropic or emmetropic. It is always necessary to produce a considerable over-effect, as a considerable part of the first result disappeared in time. The part which is lost seems to be greater in children than in adults. Further, the more superficial and peripheral the cauterization the more likely is the result to disappear in time. If, however, the cauterization extends through about one-half of the corneal thickness a permanent result will be obtained. I may mention that in some cases the result was perfect eight months after the operation. It stands to reason, however, that a longer observation—a careful discrimination as to the patient's age, sex, and state of health—would add much greater verification and value to the suggestions made above. I feel, however, justified in advising the operation for cases of compound hypermetropic astigmatism of considerable degree. Under those conditions the patient is, at any rate, sure to lose a good deal of his astigmatism and hypermetropia so as to enable him in most cases to dispense with the constant wearing of glasses. With ordinary precautions there is no risk attached to the operation."

Some Advancements Without Tenotomies, a Description of the Operation Employed, and Remarks Upon the Theory of Advancements in Such Cases.

WOOTON, HERBERT W., New York. (*Archives of Ophthalm.*, May, 1901.) The writer advocates advancements without tenotomies, at least as the primary operation, in many of the cases in which the latter procedures are now

generally employed. He gives the histories of four cases, selected from a number, as exemplifying three types of muscular anomaly in which advancements are superior to tenotomies: The first history is one of insufficiency of convergence, the second an instance of divergent squint, and the third and fourth are examples of concomitant convergent strabismus.

The operation employed by the writer differs slightly from those usually described. Wooton claims that the reaction is decidedly less than is usually observed and the resulting disfigurement less marked and of shorter duration, that it is not difficult to perform, and can be done quickly. He describes the operation as follows:

"The primary incision, as in Landolt's operation, is made about one millimeter from the corneal margin, and not, as is generally the case, in the neighborhood of the muscular insertion. It is continued above and below parallel to the margin of the cornea as far as the vertical meridian in cases of actual squint, but in cases of insufficiency, this incision need not be so extensive. The conjunctiva is then freed from the underlying structures, toward the canthus, to a point somewhat beyond the muscular insertion, and, when the vertical incision is of full length this flap can be pushed toward the canthus or can be held away from the globe by an assistant, exposing the point of insertion clearly to view; but when the vertical incision is shorter, the field of operation is rendered more distinctly visible by two incisions, one above, the other below, running from the extremities of the primary incision toward the canthus and converging somewhat as they leave the cornea."

Tenon's capsule is now picked up with the forceps at the lower border of the tendon, close to its insertion, and a small opening made in it with the scissors, through which a strabismus hook is passed under the tendon, and a second incision in the capsule frees the point of the hook as it appears at the tendon's upper border. An incision is now made through Tenon's capsule above, and below, running from the hook toward the canthus, following the borders of the muscle and corresponding in length to the extent of tendon which it is thought desirable to resect; this length of tendon is freed from the sclerotic with the

closed points of the scissors. In cases of insufficiency this resection is unnecessary.

Whether the external or internal recti are to be advanced, the effect is greatest when three sutures are employed, and each is armed in the usual way with two needles. The sutures should be of silk and not finer than No. 5, as finer threads are apt to cut their way out when this operation is performed without tenotomy of the opposing muscle. The first suture is passed from above, under the free edge of the tendon and through its middle, as far back as it has been freed from its attachments to the structures beneath; then through the conjunctiva, not at a point corresponding to the muscular insertion but about one millimeter from the conjunctiva's cut-edge on a line corresponding to the horizontal meridian of the cornea. A second suture passed similarly from above through the tendon near its upper border penetrates the conjunctiva near the edge of the vertical incision, in the neighborhood of its upper extremity; and the third suture, passed through the tendon near its lower border, penetrates the conjunctiva in like manner below.

The tendon is now cut close to the points penetrated by the sutures. The operator should of course be careful not to cut the sutures, but, on the other hand, he should be equally careful to leave no great extent of tendon between his incision and the line of the sutures, lest it project between the edges of the conjunctival incision when these are brought together. In the operating of insufficiency, the sutures should penetrate the tendon close to the hook and the tendon should be cut on the corneal side of the latter, disturbing as little as possible the structures beneath. The needles at the other ends of the sutures are now passed through the conjunctiva and superficial layers of the sclerotic as close as possible to the corneal margin, at the upper extremity, in the middle, and at the lower extremity of the conjunctival incision respectively. The sutures are now tied, advancing the insertion of the muscle quite up to the corneal margin, while an assistant diminishes the strain during the tying process by rotating the globe toward the side operated upon.

In the absence of infection, the reaction is surprisingly slight. The sutures may be removed in six or seven days,

during which time the eyes, especially when both are operated upon, should be kept bandaged, the dressings being changed every twenty-four hours. In convergent cases, one need not fear to instil atropin, even when marked divergence is apparent at the conclusion of the operation, the correcting glasses being worn and the atropin discontinued when the sutures are removed.

The advantages of this method of advancement, though perhaps slight, seem to the writer to be real. The superior and inferior attachments reaching nearly to the vertical meridian of the cornea, the effect is as great as that of the Agnew, while the closeness of the conjunctival incision to the corneal margin allows with great certainty the approximation of the tendon's severed edge. No conjunctiva is removed, and, while the tendon is snugly covered, no disfiguring bunch of conjunctival tissue remains. The cosmetic effect is remarkably good, and at the end of three weeks, the site of the operation is not more noticeable than that of a somewhat extensive tenotomy. Furthermore, the inferior surface of the muscular sheath is not interfered with, a point which I consider of the utmost importance."

The writer then gives his reasons for advocating advancements in appropriate cases, without tenotomies of the opposing muscles, as first advocated by Landolt; he believes that "they ought to form at least the *primary* operation in most cases of strabismus, and certainly in those cases, divergent or convergent, in which the difference of visual acuity between the eyes is not so great as to render the re-establishment of binocular single vision practically impossible. In the first place, they seem merely to increase the power of the *function* presided over by the muscles advanced, and do not appear to be capable of producing a permanent deviation of opposite character. In other words, they do no harm. In all cases, the muscular attachment should be advanced quite to the corneal margin, and any amount of over-effect apparent immediately after the operation will rapidly disappear. It is easy to understand why this should be so. As Landolt points out, the center of rotation of the eye is not a fixed point, and the shortening of the muscle effected at the time of the operation by advancing its insertion is quickly compensated for by the recession of the globe into the orbit, a result

which is very easily observed. The sum-total of the effect of such an advancement seems to the writer to be due, therefore, not to the shortening produced by the advancement of the insertion, nor to the shortening effected by excision of a portion of tendon moderate in length, but simply to the better leverage afforded by the new insertion.

It may be argued that, as the sclera between the cornea and the original attachment must be denuded, the under surface of the advanced muscle might become connected with the sclera as far back as the original insertion and that, in consequence, the real insertion after the operation would not differ materially from what it was before. In such a case, the effect produced would depend alone upon the shortening of the muscle and, in the writer's opinion, would be mostly temporary. That this *may* take place is of course possible, but I believe that it only does so when the under surface of the muscular sheath is damaged, and it is for this reason, in the operation just described, that the under surface of the muscle is not interfered with. In other words, the writer believes that the operation in order to be permanent in its results must *advance* not *shorten*, and he therefore excises but a moderate amount of the tendon, enough only presumably to restore the stretched and atonic muscle to its original length.

It also seems to him that, generally speaking, divergent strabismus is due primarily to an insufficiency of convergence, and that convergent strabismus is perpetuated by an insufficiency of divergence, and that, in each case, we should strive to augment the power of the weakened function by increasing the leverage with which it acts; that the primary operation should be an advancement of the single rectus if the squint be slight or periodic, but generally speaking of both, and that with the re-establishment of the power of convergence on the one hand, or the power of divergence on the other, we may reasonably hope for a return of binocular vision when the visual acuity of the deviating eye is not comparatively too low. Subsequent operations, may, of course, be advisable, depending on the degree of muscular equilibrium restored by the advancement, and particularly is this so, when, as is frequently the case, the lateral deviation is accompanied and perhaps aggravated by a vertical deviation of moderate

degree; but in cases possessing good vision, the advancement brings these errors under the domain of latent anomalies and they can be dealt with accordingly.

Tenotomies, as primary operations, particularly in convergent cases, are at best hazardous procedures. Apparent parallelism, for the time being, is frequently obtained, but almost always with great sacrifice of the power of convergence. In general, however, even this parallelism is merely apparent, binocular fixation is not really present, and in the few cases in which binocular single vision is found to exist, it is frequently subsequently lost. The reason for this is not difficult to understand. The convergence having been rendered insufficient by the operation, the patient suffers from asthenopia at near work, in consequence of which he gradually abandons binocular fixation, at first for near objects, later for those at a distance, and the eye with the poorer vision diverges. In fact, the case, at first one of convergent strabismus, has become one of insufficiency of convergence, and later one of divergent squint. The operation, one might almost say, has attempted to cure the causative factor, the hypermetropia, by superadding a pathological condition, a relative insufficiency of convergence, ignoring the fact that an excess of converging power is a normal condition with an *uncorrected* hypermetropia. Advancements in such cases produce no insufficiency of any of the associated functions of the eyes, and seek merely to restore the *status quo ante*. Furthermore, the mobility of the eyes the extent of their lateral rotations, is not limited by such operations, and anyone who will take the trouble to map out the fields of fixation in these cases, can assure himself that the advancement of one of the straight muscles of the eye does not restrict the action of its so-called antagonist."

The Etiology and Treatment of Convergent Squint.

WORTH, CLAUD, London. (*The Lancet*, May 11, 1901.) This paper and its conclusions are based upon the notes of 1278 cases of squint. In his introductory remarks the writer lays much stress upon the necessity of training the fusion faculty of children exhibiting a tendency to squint beginning at a very early age. The fusion faculty he defines as "the potential faculty of binocular vision." He

regards it as of the greatest importance in the maintenance of the correct relation between the visual axes, and considers it the key to the whole subject of etiology and the rational treatment of convergent squint.

In many cases a trained fusion faculty is in itself sufficient to cure the deviation; on the other hand, a patient may be highly hyperopic, astigmatic and congenitally amblyopic, but if the fusion faculty is naturally well-developed it is extremely unlikely that he will ever squint. In investigations made with prisms, lights, etc., in healthy children, he found the first distinct evidences of binocular vision at the age of six or seven months. The results of orthoptic treatment in young squinters seem to show that the fusion faculty normally reaches its full development at the end of six years.

The usual text-book definition of squint—deviation of the visual axis of one of the eyes from the correct position of fixation, the writer considers deficient in that it mistakes a single symptom for the whole disease. There is, he says, "in addition (1) the deformity, (2) a defective development of the fusion faculty, (3) nearly always a suppression of the vision of the deviating eye, (4) in the great majority of cases more or less amblyopia of the deviating eye, and (5) refractive error.

The various forms of convergent squint are discussed under the following divisions: (1) Occasional; (2) constant monolateral, and (3) alternating. Statistics covering 1278 cases are given, showing that in 74 per cent. the deviation appeared before the end of the fourth year.

Worth considers the foremost factor in the etiology of squint to be a defective development of the fusion faculty, to which may be added as accessories, hypermetropic and congenital amblyopia.

In the treatment he emphasizes four objects that should be kept constantly in view: "(1) to prevent the loss of central fixation in the deviating eye; (2) to prevent deterioration of the vision of the deviating eye; (3) to train the fusion faculty at the earliest possible age, and (4) to restore the visual axes to their normal relative direction."

The first object is accomplished by determining and correcting any refractive error. The age at which glasses will be tolerated depends largely upon the disposition of

the child, but chiefly upon the degree of refractive error. The writer finds that the child whose hypermetropia and astigmatism combined amount to 4 D. or 5 D. will usually wear glasses well as soon as he is able to crawl; then it becomes chiefly a question of the skill of the optician in fitting the frames.

In order to exercise the deviating eye and to prevent deterioration of vision, the writer orders one drop of atropin solution to be instilled into the fixing eye each morning thus abolishing accommodation and forcing the child to use the squinting eye, in which accommodation is not interfered with, while looking at near objects.

Central fixation can, in the writer's opinion, be restored in those cases in which its absence is of recent occurrence and in which the deviating eye wanders without taking up any definite position of false fixation. If, however, the deviating eye takes up a definite position of false fixation, the case is quite hopeless.

In order to restore the false fusion faculty, the writer has devised an instrument which he calls an "amblyoscope," by which he aims to produce simultaneous vision in both eyes. The special points of the amblyoscope are: "(1) It is adapted for use during the continuance of a squint of any degree; (2) the suppression of the vision of the deviating eye is quickly overcome by the unequal illumination of the object-slides, instead of by the slow and painful method, recommended by Joval and others, of continuous occlusion of the other eye for months or a year at a time; and (3) the variety of the pictures amuses and interests the child so that he will give all the help he can."

In regard to the question of operation, the writer states that if he is unable to get binocular vision, he does not usually operate before the age of eight or nine years. If, however, exercise with the amblyoscope has produced a strong "desire" for fusion, he has no hesitation in operating at any age.

The paper concludes with a description in detail of the writer's method of performing the advancement operation, which differs in several minor details from other methods in use.

What Routine Shall We Adopt In Examining the Eye Muscles?

DUANE, ALEXANDER, New York. (*New York Med.*

Journal, May 25, 1901.) This paper, by a recognized authority on anomalies of the eye muscles, gives the methods used in measuring such anomalies which the writer has worked up by a gradual experience and which he considers the most satisfactory. The writer remarks that the ground is already well trodden, but that there is no unanimity of opinion as to which, even of the familiar methods, is sufficient for an ordinary examination, or as to how they compare with each other in value. He considers, (1) the routine adopted in ordinary cases, (2) the deductions with regard to the relative reliability and availability of the several tests, and (3) the way in which the tests are employed specifically in operations.

"Routine of Examination.—After making a cursory inspection of the patient to detect the presence of any obvious anomaly, I direct his attention to a cardboard sheet, a foot or more square, hanging on the opposite wall of the room. In the centre of this sheet is a round black spot, one inch in diameter. I cover the left eye with a screen, and, first making sure that he is fixing the spot with his right eye, I pass the screen quickly from the left eye to the right. In so doing I watch for any deviation taking place in either eye, and at the same time ask the patient if he notices any movement of the spot. I then place prisms, appropriately directed, before the eyes, gradually increasing their strength until there is no longer any deflection behind the screen. This neutralizing prism will indicate the amount and character of the deviation as measured by the *screen test*. The same prism may also abolish the apparent movement of the spot, perceived by the patient. If not, I change the prism until this movement is absolutely nil, and thus measure the amount and character of the deviation by the *parallax test*.

If there is any noticeable deflection behind the screen, I then apply the *screen test in a second way* or by *binocular uncovering*. This well-known procedure consists in covering the left eye and then uncovering both eyes and noticing the movement that takes place. If on thus uncovering the left eye, the right eye remains steady and the left moves into position, I know that the patient has binocular fixation, and that the deflection was a heterophoria and not a squint. If, however, the right eye

should move out of its position and the left eye should move into place, I know that there is a squint and that the left eye is the fixing eye. If neither eye moves, I know that there is a squint and that the right is the fixing eye. By repeating this experiment with each eye alternately I can tell whether there is an habitual binocular fixation, an alternating fixation, or a uniocular squint. The diagnosis between the three may be conveniently formulated as follows:

1. If in binocular uncovering *but one eye moves*, we have heterophoria and not squint.

2. If in either *both eyes move* or, in spite of there being an evident deviation, *both eyes remain steady*, there is a squint.

3. In the latter case, if, when the left eye is uncovered, the eyes behave in the same way as they do when the right eye is uncovered (both alike moving or both alike remaining steady, no matter which eye is uncovered), the squint is *alternating*.

4. If, when one eye (for instance, the right) is uncovered, both eyes move, and when the other eye (in this case the left) is uncovered, both eyes remain steady, the squint is *uniocular* (confined in this case to the left eye).

I next employ the *Maddox rod* in the usual way, testing first for vertical and next for lateral deviations. For this, of course, I use a light as a test object. Next I employ the *phorometer* (Stevens's model), and again first for vertical and then for lateral deviations. With the phorometer and Maddox tests I find, like other experimenters, that I get more accurate results if, as the patient is looking through the apparatus, I cover one eye for a few moments, then suddenly withdraw the cover and make the test before the patient has had a chance to fuse or separate the double images.

The phorometer being still in position, I now use it in *testing at near points*, the test object in this case being a fine dot on a rather large card. Any object with lines in it I regard as vitiating the accuracy of the test.

Using the same test object, I then make the *near test with screen and parallax* just as for distance.

I next ascertain the *convergence near-point*, using any fine object and bringing it up close to the eyes until the

patient can no longer converge upon it, and then measuring or estimating the distance of the object from the root of the nose.

Then I determine the *prism-divergence* (abduction) and the *prism-convergence* (adduction) in the usual way with prisms, held respectively base in and base out. In testing the prism-convergence it is a good plan to notice whether the accommodation is called into play as the patient converges. This can be ascertained if we use the ordinary trial card as a test object and observe how much the patient's vision is blurred by the progressive addition of prisms base out.

Lastly, I determine the *field of binocular single vision*. This I do as follows: I place a red glass before the patient's right eye, and, standing at a distance of four feet, carry a candle so as to make it skirt successively all the outlying parts of the field of fixation. That is, I carry it first to the extreme right, then rather quickly back again to the middle line and on to the extreme left, then up (*i. e.*, to the up-and-left position), then back to the middle line (straight-up position) and on to the right (up-and-right position), then down to the horizontal plane, and then below it, so as to skirt the lower field in same way as the upper. In doing this, I note whether the patient gets diplopia in any part of the field, how great the diplopia is, and in what direction it tends to increase; and at the same time I watch to see whether the excursions of the eyes appear normal in all directions, or whether either eye lags behind in its motions anywhere.

It may often happen that the patient cannot be got to recognize diplopia, although there is an evident deviation present. I then determine the *field of binocular single vision by the screen test*, *i. e.*, I estimate the deviation behind the screen, first in the primary position, and afterward in the different positions of the fields of fixation, and thus ascertain how and where the deviation increases and whether the patient has binocular fixation everywhere.

This routine, which is sufficient for ordinary cases, occupies from ten to fifteen minutes. In special cases I employ two other accessory tests:

1. I determine the *declination* with the Maddox rod clinometer, elsewhere described. In default of this, a Maddox rod, set in trial frame, will answer as well.

2. I determine the *field of fixation*. In doing this I use a perimeter and employ as a test object two fine dots set very close together. With such an object the patient, unless fixing sharply, sees the two dots run together. If he sees them separate, this is proof that he is still fixing correctly upon them. This test object I find more satisfactory, particularly in the case of children, than the small letters that are generally employed for the purpose.

The tests recommended and the order in which they are used may be recapitulated as follows:

A.—We determine the deviation for distance by

(1) The screen and (2) the parallax simultaneously.

(3) The Maddox rod.

(4) The phorometer.

B.—We determine the deviation for near by

(5) The phorometer.

(6) The screen and (7) the parallax simultaneously.

C.—We next measure

(8) The convergence near-point.

(9) The prism divergence (abduction.)

(10) The prism-convergence (adduction).

(11) The field of binocular fixation and the excursions of the eyes.

D.—In special cases we ascertain

(12) The declination by the clinometer.

(13) The field of fixation by the perimeter.

It goes without saying that in making all the foregoing tests, I note carefully *the conditions under which they are done*—i. e., whether made with or without correction of the refraction and whether or not under the influence of homotropin.

Reliability of the Various Tests.—Of the four tests, the screen, the parallax, the Maddox rod, and the phorometer, employed in determining the balance of the eye muscles, I regard the *screen test* as by far the most reliable. It is almost universally applicable, being especially available in the case of children and also with those who no longer have binocular vision. It is fairly accurate, too. The deviation shown by it, if measured with prisms, can be estimated to within two degrees.

Next in point of reliability I regard the *parallax test*. It is usually available when the screen test is, and it is extremely precise, deflections of the smallest fraction of a degree being sharply made out.

The *Maddox rod*, although a very useful accessory test, has not in my hands proved as reliable nor as accurate as the others. It is rather apt to indicate an excess of deviation, especially in esophoria. Many patients, on the other hand, have a strong tendency to unite the line of light and the flame, insomuch that some will always see them united even with prisms of high degree. This source of inaccuracy may be partially avoided by making the test in the way already mentioned, *i. e.*, by screening one eye for a few moments, then suddenly removing the screen and determining the relations of the flame and the line of light immediately, before the patient has had a chance to unite them. In estimating vertical deviations I find the Maddox rod usually very accurate.

The *phorometer* is also a very useful accessory, but in many instances, particularly at near points, indicates an excess of deviation. However determined—whether by the phorometer, Maddox rod, screen, or parallax—the deviation should be ascertained *both for distance and for near vision*. This I regard as of essential importance. A comparison of the findings for distance and for near vision will show whether the deviation increases or diminishes as the test object approaches the eyes—an important factor in distinguishing divergence and convergence anomalies—and in the case of squint will show whether the latter is periodic or not.

Also of considerable value as bearing on the diagnosis is the determination of the *convergence near-point*. This is of essential importance in distinguishing a true convergence insufficiency from an exophoria or divergent squint due to a divergence anomaly or due to a simple disuse of the converging power such as we may find in the early stages of an accommodative exophoria. Furthermore it is of great importance in determining whether in a given case of exophoria or divergent squint we are likely to secure a favorable result by a simple tenotomy of the externi or shall have to do an advancement of the interni. Finally, it is a test that should never be neglected in

gauging the effect of an operation on the interni, since tenotomy of the latter should never be carried so far as to make the convergence near-point recede unduly.

Just as the convergence near-point shows the absolute maximum of convergence of which the patient is capable, so the *prism-divergence (abduction)* gives us the absolute maximum of diverging power. Its actual amount in a given case will often indicate whether we are dealing with a divergence or a convergence anomaly. Hence I regard its determination as a very important feature of the examination.

I would not say as much for the *relationship between the abduction and adduction*, upon which some have laid so much stress. This relationship varies so much in the same individual from time to time that I cannot regard it as of importance. The prism-divergence, in fact, is an absolute maximum, the prism-convergence usually a small and varying fraction of a maximum. It seems to me unreasonable to institute any comparison between two magnitudes so constituted.

Nor can I find that much importance attaches to the determination of the *abduction at near points*. This also varies so much in the same individual that I cannot see what deductions can reasonably be drawn from its determination, except in special cases.

The estimate of the *field of binocular single vision*, if carefully made, I regard as very important. When a patient has actual binocular single vision he will see a parti-colored light; when he has unocular vision he will see one light, red or yellow, as the case may be. When he has true diplopia he will see two lights, one red, the other yellow.

By drawing the patient's attention to this point we can in almost all cases decide the kind of vision that he has, and determine accurately the presence and amount of diplopia. And by observing how and where this diplopia increases we can ascertain what muscle or muscles are affected and to what extent. On the other hand, the presence of binocular single vision in the whole field of fixation necessarily excludes a real insufficiency of any ocular muscle.

Hence, by thus determining the field of binocular single

vision either with the candle or with the screen test, and by noting at the same time the limits of excursion of the eyes, we can in general distinguish an insufficiency of the interni or externi *per se* from an esophoria or exophoria due to a divergence or convergence anomaly.*

I have not been led to attach so much importance to the determination of the *field of fixation* by the perimeter. The limits of excursion for each eye, when examined separately, vary considerably even in the same patient. Again, it is only when the eyes are under the impulse afforded by binocular vision that they move in their natural way, and it is not infrequent to find that when the examination of the field of fixation shows no great limitation there is yet a decided restriction of the excursion of one eye as compared with the other when tested with the red glass and the candle. Nevertheless, in doubtful cases the mapping out of the field of fixation may be of service in showing whether a given deviation is due to a muscular over-action or a muscular insufficiency.

Application of the tests in operations. It is my invariable practice to test a patient carefully, not only just before an operation, but also several times during its performance and immediately after its close. For this purpose I usually rely upon the screen and the parallax tests, at times also using the Maddox rod. If a patient shows diplopia, I also measure its amount, but the measurement of the diplopia affords much less certain results than the test by screen and parallax. These latter tests require no apparatus beyond a few prisms, and even these may be dispensed with, except toward the close of an operation, when we wish our measurements to be quite precise. Furthermore, they can be applied in a moment and without changing the position of the patient, and they are not confusing to him, so that we are not so likely to have any error owing to his misinterpretation or misstatement of what he sees.

I habitually stop two or three times at least during the course of an operation to make these tests and ascertain by them whether I have gone far enough. If not, I continue, gauging the extent of my next step by the result of the test last made, and pausing only when actual measurement shows me either that I have attained just the effect that I desired to secure or that I have gone as far as

safety allows. This method of operating is not brilliant and it is tedious, but it certainly affords satisfactory results and is safe."

A New Clinometer for Measuring Torsional Deviations of the Eye, Delimiting Paracentral Scotomata and Metamorphopsia, and Detecting Simulation of Blindness.

DUANE, ALEXANDER, New York. (*Phila. Med. Journal*, June 8, 1901.) Dr. Duane doubts whether the usefulness of the Maddox rod as a means of estimating torsion of the eyes has been fully appreciated. "The utility of being able to determine the degree of torsion in paralysis of one of the vertical muscles is obvious, and the Maddox rod is admirably adapted for accomplishing this in a simple and efficient manner. It would be equally applicable for the determination of a cyclophoria. But, apart from cases of paralysis, which are comparatively few, and apart from cases of cyclophoria, which in the present state of our knowledge must be characterized as supposititious, the test seems to have a much wider range of application. For it can serve to determine in any given case the ability of the eye to judge whether lines are truly vertical and horizontal or not, and whether two given intersecting lines really form a right angle or not. Having thus determined by actual measurement how near the truth the patient's estimates of these things are, we can then proceed to ascertain how far these estimates are affected by the addition of glasses. If his notions in this regard—i. e., of the directions and relations of horizontal and vertical lines—are much altered by the glasses, we may consider it as at least quite likely that such glasses, even if they seem otherwise correct, will produce distortion when worn. That such distortion not infrequently results from the use of cylindrical glasses, we all know. It causes the patient much annoyance. He is apt to complain of it a good deal, even when the glasses are in other respects acceptable. Hence it would be a very desirable thing if we had some means of predicting whether or not in any given case a distortion of this sort was likely to ensue with a correcting glass such as we wish to prescribe."

The writer has constructed an instrument called a clinometer, designed to apply the Maddox rod to the determination of these problems. It consists of two Maddox rods,

each mounted so as to revolve freely in a frame composed of a square metal plate, sliding freely along the horizontal bar of a Stevens' phorometer. One plate is designed for the right eye, the other of ruby glass, for the left. The plate is provided with a graduated arc, and the revolving piece containing the Maddox rod has two indexes, so disposed that when the index marked V is at zero and the phorometer bar is leveled, the line of light is strictly vertical; when the index H. is at zero, the line of light is horizontal.

When using the instrument, the patient is seated so as to face a small brilliant light on the other side of the room which should be darkened. The patient is directed to look with his right eye through the right Maddox rod, which is then rotated until he says that the line of light appears vertical. If the index V then stands at zero or very close to it, we know that his vertical meridian is truly vertical. "If, on the contrary, it should point to 8° on that portion of the arc above the zero mark (the portion marked on the instrument with the letter L), we would know that his vertical meridian was rotated by that amount to the *left*. Similarly, if the index pointed to 5° below the zero mark (toward the letter R upon the instrument), we would know that the vertical meridian was rotated 5° to the *right*.

"The test is then repeated with the left eye alone (the right being covered) and afterward with both eyes simultaneously. In the latter case, the two rods, one before the right eye, the other before the left, are turned until the two lines of light, one white, the other red, both appear vertical and either coincident or at least parallel.

"The behavior of the eyes as regards vertical lines being thus determined, the same series of tests is then made for *horizontal lines*, the Maddox rods being turned until the patient says that the line of light is horizontal, and the amount of deviation from true horizontality being ascertained from the reading of the index H."

The apparatus may also be used for making the ordinary Maddox rod test for heterophoria, one eye being left uncovered; as a test for binocular metamorphopsia and for the distortion produced by cylinders; as a test for scotomata and for retinal metamorphopsia; and to detect simulation of uniocular blindness.

"The clinometer may furnish a ready means of determining the presence of scotomata or of a localized metamorphosia due to retinal disease, provided the areas of retina involved are not too remote from the macula. For, if the patient looks through the centre of one of the Maddox rods with the affected eye (the other eye being covered), he will see a line of light extending about 20° on either side of the point of fixation. By revolving the rod in its frame, we can make the line of light sweep in a circle, so as to occupy successively all points of the retina about the macula and not situated more than 20° from it. If the line appears interrupted in any part of its length, we should suspect a scotoma, and if it appears curved or otherwise distorted, we should suspect metamorphopsia, the change in either case being due to involvement of a corresponding portion of the retina."

The following is the method of procedure in detecting simulated blindness: "Suppose, for example, the left eye is alleged to be blind. The instrument is placed with one rod before each eye, when the patient will see two lines, one red, the other white, either intersecting at an angle or else parallel and then blended into one. He cannot tell which eye he sees the red line with nor, in fact, whether he does not see both lines with the right eye alone. To still further confuse him in this regard, the rods may be interchanged (by swinging the phorometer bar round), or both lines may be made to appear red by sliding a ruby glass before the white rod, or finally either line may be cut off by shoving a card in front of one rod. The patient who alleges blindness of the left eye is detected if he can be got to admit either that he sees the two lines, or simply that he sees the red line formed by the left-hand Maddox rod.

"Probably the best procedure is to set both rods vertical, and then, unknown to the patient, slip a red glass before the right-hand rod. The patient will then see a single red line, and, as it is still present, if he simply shuts the left eye, he will admit that he sees it. The red glass is now slipped a little aside and the left rod is rotated. The patient, who now sees two intersecting lines, one red, the other white, will think the white line is seen by the left eye, and while still admitting that he sees the red line, will probably deny

that he sees the white. It is then evident that he is malingering, and the imposition can readily be demonstrated to a bystander, if, leaving the rods in position, we put him in the patient's place."

An Easy Operation for Congenital Ptoxis.

FERGUS, FREELAND, Glasgow. (*British Med. Journal*, March 30, 1901.) "Any operation undertaken for the rectification of this abnormality must fulfill two conditions: it must be efficient for the purpose, and it must be so arranged as to leave no cicatrices or scars. I was recently asked if I could operate on a case of ptoxis without leaving much disfigurement, and I employ the following method, which I found easy of execution, and which gave results satisfactory alike to myself and my young patient's friends:

A horizontal linear incision was made in the eyebrow along its whole extent, this situation being selected because the hairs of the eyebrow afterward completely hide the scar. No other skin incision is required. With a few strokes of a scalpel the skin was completely separated from the underlying tendon and fascia of the occipito-frontalis muscle; the separation was carried to about a distance of nearly 2 inches above the horizontal wound. In the opposite direction the skin and fascia and portions of the muscular structure were separated from the orbicularis muscle and from the tarsus; the division being carried almost to the free margin of the eyelid.

The next step was to mark out a vertical band of the tendon and fascia of the occipito-frontalis, about three quarters of an inch broad and 2 inches long. This was dissected up from all underlying structures, and when the dissection was complete its only attachment was to the occipito-frontalis at the part furthest away from the skin incision. The end of the band was drawn down to the upper eyelid, and its margin was secured by catgut sutures as near the margin of the lid as possible. The wound in the skin was closed and covered with a sterilised dressing. The wound healed rapidly and well.

The article is illustrated by figures reproduced from photographs taken a month after the operation, showing an excellent result both when the lids were closed as well as when the eyes were opened.

"An operation such as the above seems to present many advantages over those commonly employed. Till now the operation which gave the best results in my hands was unquestionably that of Professor Panas, but, his operation, although thoroughly removing the ptosis, always left, so far as my operations were concerned, very ugly cicatrices. I have never tried Pagenstecher's modification of Dransart's operation, as it has always seemed to me to be an extremely crude proceeding to trust to inflammation set up by subcutaneous sutures. Moreover, such sutures will not set up the desired inflammatory reaction if they are perfectly sterile when introduced, and surely modern surgical knowledge entirely forbids the introduction of any sutures which are not thoroughly aseptic.

Since performing the operation I have glanced at the literature of ptosis operations, and the only proceeding at all like the one above described which I have been able to find is that of Kunn described by him in 1893. The differences between the method described above and his are very considerable."

Peritomy in Episcleritis, Iritis, Herpes Ophthalmicus, and Purulent Ophthalmia.

TEALE, T. PRIDGIN, Leeds. (*The Lancet*, March 30, 1901; report of the March meeting of the Ophth. Soc. of the United Kingdom.) Under the name of syndectomy or *tonsure conjunctivæ* this operation was introduced by Furnari of Paris for the treatment of panniform and chronic lesions of the cornea and for vascular ulcerations and interlamellar opacities. The first notice in English literature was an article on Syndectomy by Mr. Bader in the *Ophthalmic Hospital Reports*, Vol. IV., p. 109, for 1863, in which the author gave copious extracts from the original papers. Syndectomy was, as its name implies, an excision of a strip of conjunctiva and sub-conjunctival tissue denuding and exposing a ring of sclera round the cornea one-third of an inch in width. It was discovered that this sacrifice of conjunctiva was unnecessary and might at times be an actual disadvantage, so that peritomy came in as a substitute. By peritomy was meant the laying bare of about one-quarter of an inch of the sclera immediately around the sclera by scissors and the division of all the vessels in that area which entered or emerged from the

solera without any cutting away of tissue. This separated conjunctiva in some cases reunited so rapidly with the denuded surface and corneal margin that in severe cases it was well to make two, three, or four radial cuts into the free edge of the conjunctiva so as to retard union and secure a more distinct cicatrix as a means of cutting off and constricting the vessels.

The late Mr. Hewetson called their attention in Leeds to the remarkable effect of syndectomy or peritomy on the diffuse keratitis of inherited syphilis—an effect Mr. Teale fully endorsed from practical experience, and he wished now to produce evidence of its value in episcleritis, iritis, herpes ophthalmicus, and purulent ophthalmia, and to raise the question of its possible use in rare cases for the relief of tension.

In episcleritis, a most painful and intractable affection, the immediate effect of peritomy in the relief of pain and suffering were marked, and in the three cases so treated considerable advance toward recovery in the local condition had taken place in the succeeding two to five months. In iritis of an obstinate character, whether syphilitic or otherwise, similar effects were noted; and in the three cases recorded immediate relief of pain was followed by steady improvement in the local appearance and vision in the course of a fortnight.

There were probably few affections of the eye which were more unmanageable and more to be dreaded than the ulceration of the cornea and congestion of the conjunctiva which were associated with herpes. In two cases treated by peritomy the pain rapidly subsided, and in the course of a week or ten days the healing of the ulcerated cornea and clearing of the inflamed iris were well advanced.

In a case of sub-acute purulent ophthalmia originating in congenital infection of several days' duration and presenting marginal ulceration of the cornea and opacity completely obscuring the pupil peritomy was performed, and with such benefit to the eye that the degenerating process was at once arrested and in a week the child was sufficiently recovered to return home. When seen six months later it was difficult to detect which had been the affected eye.

As an example of the utility of peritomy in the relief of

tension the following case was cited. A woman had lost the right eye from irido-cyclitis accompanied by increased tension which an iridectomy by a skilled ophthalmic surgeon had failed to arrest. Subsequently the eye was excised. She had an insuperable dread of an iridectomy in the other eye which was beginning to suffer in like manner, with the tension $+ 2$, vision reduced to Jaeger 14, and a partially inactive pupil. Peritomy was performed on Sept. 28th, 1900. On Oct. 5th, there had been steady improvement: vision Jaeger 8, Tension $+ 1/2$. On Nov. 26th, vision had fallen off. Tension was normal. Later still vision was reduced to preception of large objects. In this case peritomy checked for a time the disorganising process and reduced tension but did not permanently arrest the mischief.

Pterygium Operation, Method by Subconjunctival Antero-Inferior Fixation.

McREYNOLDS, JOHN O., Dallas, Texas. (*Ophthalmic Record*, May, 1901.) After trying the various forms of operation for the radical cure of pterygium, the writer has finally adopted a plan which has never disappointed him during the last few years. He describes the procedure as follows:

1. Grasp completely the neck of the pterygium with strong but narrow fixation forceps.
2. Pass a Graefe knife through the constriction and as close to the globe as possible, and then with the cutting edge turned toward the cornea shave off every particle of the growth smoothly from the cornea.
3. With the fixation forceps still hold the pterygium, and with slender, straight scissors divide the conjunctiva and conjunctival tissue along the lower margin of the pterygium, commencing at its neck and extending toward the canthus, a distance of one-fourth to one-half of an inch.
4. Still hold the pterygium with the forceps and separate the body of the growth from the sclera with any small non-cutting instrument.
5. Now separate well from the sclera the conjunctiva lying below the oblique incision made with the scissors.
6. Take black silk thread, armed at each end with small curved needles and carry both of these needles

through the apex of the pterygium from without inward and separated from each other by a sufficient amount of the growth to secure a firm hold.

7. Then carry these needles downward beneath the loosened conjunctiva lying below the oblique incision made by the scissors. The needles, after passing in parallel directions beneath the loosened lower segment of the conjunctiva until they reach the region of the lower fornix, should then emerge from beneath the conjunctiva at a distance of about one-eighth to one-fourth of an inch from each other.

8. Now with the forceps lift up the loosened lower segment of conjunctiva and gently exert traction upon the free ends of threads, which have emerged from below, and the pterygium will glide beneath the loosened lower segment of the conjunctiva, and the threads may then be tightened and tied and the surplus portions of thread cut off.

It is very important that no incision should be made along the upper border of the pterygium, because it would gape and leave a denuded surface when downward traction is made upon the pterygium.

The advantages claimed for this method are that after the operation no disfiguring vessels remain in the palpebral fissure since the pterygium is hidden behind the lower lid; no denuded area of sclera remains; and the danger of recurrence is avoided.

Resection of the Superior Cervical Ganglion of the Sympathetic for Glaucoma, and Its Results.

DODD, H. WORK, London. (*The Lancet* Mar. 23, 1901.) Referring to a case of chronic glaucoma treated by resection of the superior cervical ganglion, reported on a previous occasion, the writer stated that "if such an operation does permanently and satisfactorily arrest the glaucoma, preserve the sight, relieve the pain, and restore the patient to even comparative comfort, then I consider it may be undertaken." The later results of this first case, however, as also those of his second case, reported in this paper, are not as favorable as to lead him to regard the operation as successful in the cure of chronic glaucoma. In this second case, as well as in the former one, the immediate effect of the operation was good, for the tension was diminished, the pupils contracted, and vision was improved.

But after several months, the conditions were the same as before the operation. Judging from his results from these two cases, the writer believes that Jonnesco's operation does not cure chronic glaucoma. He concludes with the following remarks:

"The central origin of glaucoma may be a fact, but if it be so, the removal of the superior cervical ganglion apparently does not interrupt the connection with the eye. Either the connection is not by this route or some other means of communication are established very soon after resection of the ganglion. These cases seem rather to point to chronic glaucoma being a peripheral trouble."

Optic Neuritis From Intranasal Disease.

VAIL, DERRICK T., Cincinnati, Ohio. (*Am. Journal of Ophthalm.*, May, 1901.) The object of the writer's essay is to call attention to the fact that the nasal factor is often overlooked in cases of acute retrobulbar neuritis, although acute sinusitis is frequently the direct cause of such an inflammation of the optic nerve. He reviews briefly the anatomical relations between the sphenoidal sinus and many important ocular structures, such as the optic nerve, the ophthalmic vein, the third, fourth, fifth and sixth nerves and the lymph channels of the orbit; and he demonstrates how rapidly these structures might be affected either by direct compression or by transmission of infection, when the sphenoidal sinus is distended with pus. The bulging of its lateral wall might first cause compression of the optic nerve and some choking of the part within the optic foramen; this would lead to a true interstitial neuritis with some distension of the original sheath in front of the optic foramen; the neuritis would descend to the eyeball showing the different stages of transudation, plastic exudation, arrest of function, &c., though there would be no choked disc as the compression is behind the entrance of the central artery and vision.

The following three distinct types of optic neuritis from nasal origin are described by the writer:

"(a) *Acute fulminating retrobulbar neuritis*, due to mechanical compression of the optic and ophthalmic divisions of the fifth nerve, from swelling of the lateral walls of the sphenoidal cavity. This form results in rapid profound amaurosis associated with violent cyclonic neuralgic pain.

"(b) *Acute retrobulbar perineuritis and optic lepto-meningitis*, due to infection (?) carried from the nose via the lymph channels. Here there is no compression neuritis, like in the foregoing class, but there is infection and swelling of the subvaginal perineural lymph spaces. It is manifest that this class is free from pain and that the amaurosis is much less marked, although the ophthalmoscopic picture is much the same as in class 'a.'

"(c) *Retrobulbar optic neuritis secondary to optic venous thrombosis*, the origin of which is intra-nasal in a vast majority of cases."

The striking features of acute fulminating retrobulbar neuritis from nasal origin, as stated by the writer, are:

"(a) The rapid onset, course, duration and termination as compared with other forms of optic neuritis. (b) The presence of excruciating pain, involving most all of the branches of the first division of the fifth nerve. (c) The complete loss of vision in a short space of time after the outset (from a few hours to a few days), and the rapid return of fair vision in most of the cases with, however, more or less optic nerve atrophy and frequently with absolute or relative central scotoma. (d) The absence in many cases of positive evidence within the nose that the trouble is of nasal origin.

"The treatment will suggest itself. In as much as blood-letting is indicated anyway, I would not hesitate to remove all or a part of the middle turbinated bone and at least try to get into the sphenoidal cavity, but would be heedful of the dangers. I think the middle and superior straits of the nose are the ideal places from which to draw blood in this class of cases, because the opening of the blood-vessels supplying the nasal attic would have a direct influence on lessening the orbital congestion. The nasal operation affords a two-fold purpose—blood-letting and drainage."

The Ocular Expression of Intranasal Lesions.

SATTLER, ROBERT, Cincinnati. (*Journ. Amer. Med. Assn.*, May 18, 1901.) The writer confines himself to the mention of two rather uncommon forms of intranasal lesions which, so far as their ocular expressions are concerned, have not been fully described. His observations and conclusions, though of interest to both specialties, are

here considered wholly from the standpoint of the ophthalmologist.

"The first group includes certain chronic lesions which invade the anterior region of the middle meatus of the nose—the most anterior cells of the ethmoidal labyrinth—bulla ethmoidalis, the region of the uncinate process, hiatus semilunaris and infundibulum. The point of interest is that the morbid changes which are enacted and account for persistent ocular phenomena are attended by a lesser or even an entirely negative expression on the part of the nose. In some cases all tangible evidences (of nasal disorder) are absent until revealed by an exploratory operation undertaken mainly for purposes of diagnosis."

"*Clinical Expressions of Lesions.*—Two principal clinical expressions of lesions of this region of the nose on the part of the eyes are met with:

"1. Persistent injection of the vessels of the ocular conjunctiva with prominence and distention also of the muscular branches, often accompanied by passive edema of the retrotarsal folds. The palpebral conjunctiva does not ordinarily participate in this vascular engorgement. There is no abnormal secretion in quantity or quality, but there is present much functional distress of the eyes. Not infrequently there is observed a retraction of the upper lid and that peculiar stare which is so generally associated with a retarded lid action due to disordered innervation of the sympathetic fibers.

"2. The other or second clinical expression dependent on the same or a similar intranasal disturbance, consists of a group of far more unmanageable and persistent symptoms. In cases of this class, the most persistent neuralgic phenomena, not conspicuous because of their severity, but mainly for their persistent nagging features, are present, associated with the most distressing functional disturbances of the eyes.

"Any continued effort in reading, or other close work, produces prolonged and severe suffering. This is most pronounced during the early part of the day and wears away toward its close and at night. The pain is neuralgic in character. It is referred to certain points along the inner wall of the orbit, the eyeball and the brow. The

most uniformly present points of pain are those along the inner and upper orbital wall. They can be easily discovered by passing and pressing the finger against the inner wall of the orbit at a short distance from the free margin. Exposure to bright light, sudden changes of temperature, over-heated air laden with dust or irritating vapors—in fact, anything which may irritate the mucous surfaces of the nose through external agencies, as well as internal ones resulting from excessive mental fatigue, an overwrought nervous system from worry or other reasons, are the exciting causes for this persistent suffering referred to the eyes and frontal regions.”

“The second group refers to cases better understood and unmistakable so far as the diagnosis and general character of the nasal and ocular lesions are concerned.

“There is invariably present in these cases a focal suppuration in the nose—of the inferior meatus, inferior turbinate—or of the adjacent cells of the ethmoid and frequently of the maxillary sinus. The nasal lesion, however, because of the dominant ocular symptoms, does not receive adequate attention.

“The cases referred to are those which are considered the most unmanageable of tear-sac and nasal duct lesions. Chronic suppuration with fistula of the tear-sac and granular degeneration of its mucous linings are present, together with thickening of its walls, vicious bone-ulceration and sequestration on the part of the osseous portion of the nasal duct, focal suppuration of the inferior meatus of the nose, ethmoidal labyrinth, maxillary sinus, etc.

“These are the cases in which radical extirpation of the tear-sac by cauterization or excision, with or without removal of the lachrymal gland, is necessary. The removal of the lachrymal gland may not be necessary in all cases. If the removal of the tear-sac is thoroughly accomplished, and if the nasal lesion at the same time receives the attention it deserves, good and permanent results can be obtained without it. For this reason, the removal of the lachrymal gland should not be resorted to in surgical ventures of this kind, until it has been demonstrated that this is a necessary measure.

“The method which has furnished me with the best results includes, in addition to the most radical extirpation

of the tear-sac—excision, curettage—equally thorough attention of the nasal lesion.

Briefly described, the operation which has been practiced successfully in numerous instances, consists: 1, in the destruction and obliteration of the canaliculi or entrance to the dilated and suppurating tear-sac, by the aid of the galvanocautery. This is followed by excision of the tear sac through a large incision until every vestige of the soft parts, the circum-saccular thickenings and fistulous tracts, etc., are removed. The osseous canal—the most important feature of the operation—is now widened with chisel, mallet and curette, until a free, funnell-shaped communication with the nose has been secured and every trace of carious or sequestered bone has been thoroughly removed. The adjacent smaller cell or cells of the turbinates, as well as the cells of the ethmoidal labyrinth, are next opened, explored and, if necessary, curetted until the floor of the inferior meatus is reached. The inferior and middle turbinate are as thoroughly removed as the judgment of the surgeon may direct, to bring about a large and free cavity. The external wound is closed with sutures.

“The advantage of this method is that the external wound closes and heals up rapidly, and drainage or whatever subsequent treatment may be necessary, is accomplished with ease through the nose. The after treatment is much shortened and less painful, and the resulting scar much less conspicuous.”

The Influence of Nicotin on Ganglion Cells: Its Bearing on the Pathology of Tobacco Amblyopia.

FISHER, J. HERBERT, London. (*Ophthalmic Review* June, 1901.) The writer directs attention to Professor Langley's experimental work on the influence of nicotin and certain other drugs on the activity of ganglionic nerve cells. The investigator found that nicotin, whether injected into the vein of a dog or applied locally to an exposed superior cervical ganglion, had the effect of destroying the power of conducting impulses; so that electrical stimulation of the cervical sympathetic on the proximal side of the superior cervical ganglion, or of the ganglion itself, failed to produce any secretion of saliva. But if the stimulus were applied to the nerve fibres between

the ganglion and the gland, the gland cells at once secreted actively. This same loss of conductivity was also observed in the ganglion cells of other parts of the body; but in no case was there any interference with the conduction of a stimulus when the latter was applied on the distal side of the ganglion. Langley, therefore, arrived at the conclusion that nerve impulses, whether motor to striped or unstriped muscle, secretory, vaso-motor or inhibitory, are arrested in an animal under nicotin, providing they have to traverse ganglion cells.

The writer finds that these facts have an intimate relation to the cases of nicotin poisoning which we designate as tobacco amblyopia. If it could be shown that the sensory impulses received at the macula must pass through ganglion cells before reaching the brain, while the more peripheral impressions pass up directly, then the application of Langley's observations to the visual apparatus would afford a more rational explanation of the pathology of tobacco amblyopia than does the present theory of a retro-bulbar neuritis with a selective action on the papillo-macular bundle. He puts the question: "Do the nerve impulses of the macular region pass through nerve *cells en route* for the cerebral cortex, and do those of the more peripheral parts of the retina pass directly?" He presents numerous arguments based on anatomical and physiological facts, tending to justify an affirmative answer.

Fisher also draws attention to the fact that several authors (de Schweinitz, Nuel, and Holden) believe that central toxic scotoma is not primarily the result of a neuritis of the macular bundles, but of a disease of the macula lutea causing degeneration of the ganglion cells. The writer inclines to this view; using Prof. Langley's work as a basis, he regards the central amblyopia in nicotin poisoning as due to interruption in the transmission of those impulses which have to pass through the ganglion cells upon which the alkaloid acts; this enables us to explain more satisfactorily than hitherto, why direct vision suffers out of all proportion to indirect vision in this affection.

Note on the Pathology of Toxic Amblyopia.

PARSONS, J. HERBERT, London. (*British Med. Journal*, June 8, 1901.) The author reviews briefly our present

knowledge of the pathology of the various forms of toxic amblyopia; he alludes to the discovery of Samelsohn, in 1880, of a degeneration in the papillo-macular bundle of fibres in cases of tobacco amblyopia; and he speaks of the failure of Sachs and de Schweinitz, before the discovery of Nissl's delicate staining method, to find changes in the retinal ganglion cells to account for this degeneration.

He mentions the cases of experimental amblyopia produced in animals by the administration of different poisons, in which Holden found distinct changes in the ganglion cells and nuclear layers of the retina, attributed largely to the diminution in the blood supply due to vaso-constriction of the vessels. These results have been confirmed, with some modifications, by Birch-Hirschfeld.

Experimental investigations by the author himself lead him to indorse the conclusion arrived at by Langley, that nicotin acts not essentially upon the nerve cell, but upon the branchings (synapses) of the pre-ganglionic fibres around the cell. At the same time he admits the possibility that there may be changes in the cell itself which even the delicate Nissl method does not reveal. The writer, therefore, finds it reasonable to suppose that the action of nicotin is a double one: (1) vascular, causing vaso-constriction of the arterioles, which would explain the selection of the sparsely-supplied macular region; and (2) paralytic, upon the synapses either of the cone fibres, or of the inner granules, or of both.

Alcohol and Tobacco Amblyopia In Cuba.

FINLAY, C. E., Havana. (*Archives of Ophth.*, May, 1901.) The writer's experience during eight years in which he has been practicing in Cuba, are at variance with authoritative statements hitherto made in connection with the alleged immunity of the Cubans and Spaniards from tobacco amblyopia. He presents a series of 92 cases of alcohol and tobacco amblyopia occurring in private practice, transient disturbances not having been taken into consideration. These cases are presented in tabular form at the end of the paper.

Regarding occurrence, he found no immunity of the Spanish race; 75 out of 92 cases occurred in Cuban or Spanish whites; the great majority of cases occurred in males; most of the cases were found between the ages of

thirty and forty; most cases were mixed alcohol and tobacco amblyopia; the symptoms and course were the usual ones.

Concerning results, he considered these as good, when a distinct improvement in the diminished visual acuity was brought about (25 out of 45 cases); as moderate, when this has been slight or none at all, but the diminution had not progressed (16 out of 45 cases); and as bad, when the visual acuity continued to diminish in spite of treatment (4 out of 45 cases).

Changes in the Fundus in Pregnant and Lying-In Women.

BOSSE, BRUNO, Königsberg, Prussia. (*Archives of Ophthalmol.*, May, 1901.) Since it is a well-known fact that the physiological processes of the sexual life of women may exercise, under certain conditions, an influence upon the visual apparatus, the writer regarded it as natural to assume that similar changes occur in pregnancy. The hydraemic quality of the blood with impeded circulation and the branched venous network of the eye with its extensive lymph spaces, seemed favoring conditions which led to changes elsewhere in the body.

One hundred and twenty-four gravid women in the hospital were examined ophthalmoscopically, ranging from the fourth month on; about one-half were in the tenth month. There were found signs of congestion in the optic disc, increasing in intensity and well-marked from the seventh month; in the tenth month, three-quarters of all the women presented such signs; extreme degrees were, however, rare.

"The beginning seemed to be a venous stasis occasionally observed in the earlier months. Following this a condition of intense redness of the disc followed, in which the margin could be still recognized, but usually became obliterated in its nasal portion, giving place to a diffuse greenish red, and later a darker, discoloration. If the vessel-funnel was in the middle of the disc, there was formed about it a more or less broad marginal zone, whose color was at first a veiled gray, and later a more positive gray. The margin of the disc, which was distinguishable in many cases, usually was obliterated first on the nasal side, and the sooner the nearer the color of the disc approached that of the choroid. At this time

the disc is often indicated by the confluence of the vessels only. The moderate swelling, as evidenced by the parallax displacement, concealed the lamina cribosa or any physiological excavation, and sometimes apparently doubled the diameter of the disc. Both eyes were not always affected alike; the disc of one eye may not be recognizable, while the other is blurred at the nasal margin only. The venous stasis remains apparent in the tortuosity of the veins. Pulsation is rare. The retina is scarcely involved. . . . The symptoms were similar to those of optic neuritis. The remarkable feature, however, is that subjective disturbances never occurred."

The writer explains these processes by a "hindered carrying-off of the altered blood through the central vein." "The harmless nature of the processes described is shown by the speedy resolution of the changes, as observed in about three hundred cases. On the first day after labor in only one-eighth of the cases is the fundus normal; on the second day one-fourth; from third to the tenth day nearly one-half; on the eleventh day two-thirds, and on the fifteenth day no abnormality was found in any case. The retrograde changes follow the same course as the progressive changes."

Postpartum Metastatic Panophthalmitis, With a Clinical and Pathological Study of a Case.

PYLE, WALTER L., Philadelphia. (*Amer. Medicine*, May 11, 1901.) The writer reviews our knowledge of this disease, pointing out that, although thirty years ago medical literature contained frequent references to metastatic suppuration of the eyeball after labor, the condition is very rare in this country at the present day. The time of occurrence is given as from the fifth to the fifteenth day after delivery. "Monolateral cases seem to be twice as frequent as bilateral, but as in the latter instance there are generally also bacterial thrombi in the internal viscera or brain, causing profound constitutional symptoms and usually death, it is likely that many cases of bilateral intraocular metastasis have been overlooked. In the bilateral cases one eye is affected within a few days, at the most, of the other."

"In postpartum metastatic panophthalmitis there are, of course, the associate local symptoms, such as vulvitis,

vaginitis, purulent lochia and pus about lacerations and suture-openings. Persistent and extreme variation in temperature and pulse, with perhaps a chill, occurring within 48 to 60 hours after delivery, are all indicative of general puerperal septicemia. However, it should be recorded that postpartum ophthalmitis may follow an apparently normal labor."

"Unless the general condition is so grave as to prevent the complaint of subjective phenomena, an early ocular symptom is loss of vision. This may occur with obscuration of the fundus oculi before external signs of inflammation are noticeable. Usually there is injection of the globe and signs of iritic disturbance, with, perhaps, the formation of synechias. Slight hypopyon may appear in the anterior chamber. There is soon, however, the formidable picture of panophthalmitis—intense inflammation, chemotic swelling of the conjunctiva and lids, protrusion and immobility of the eyeball, and a whitish-yellow reflex from the pupil. There is intense burning pain in the eyeball and orbit, and in the surrounding frontal, temporal and malar regions. The globe becomes a virtual abscess cavity, the sclera ruptures, the contents of the eyeball escape and the orbit becomes infiltrated. In some cases there is a less acute course, not involving the orbit, and allowing for a time an imperfect fundus-reflex. Such indolent cases are often almost painless, but eventually vision is entirely lost, and even though the sclera does not rupture, the eyeball becomes atrophied."

"Diagnosis is based upon the panophthalmatis occurring within a few days of delivery, and the associate local and general symptoms of postpartum infection. Unless the vitreous remains clear enough to permit of ophthalmoscopic examination, it is impossible to decide whether the initial infection is a choroiditis, retinitis or chorioretinitis. In the chronic cases the diagnosis may be in doubt for a time, but it is eventually no less certain."

Regarding the etiology and pathology, the writer points out that there is abundant proof of its bacterial origin, the septic emboli from the infected genitalia entering the blood vessels of the choroid or retina, adding, however, that it is quite possible for a suppurative panophthalmitis to follow nonseptic embolism of the central artery of the retina.

"There is always a question or doubt as to the initial ocular lesion; both the choroid and retina may be the seat of destructive inflammation."..... "Leber and Schoebl emphasize the fact that cell-infiltration always begins in the nerve-fibre layer of the retina and spreads to the other layers and into the vitreous. This infiltration is greatest near the bloodvessels, and there is an accompanying perivascularitis and endovascularitis. In advanced cases the retina is detached and may be demonstrated only by a single thread of densely infiltrated retinal tissue and vascular debris. The choroid, vitreous, lens, cornea, sclera, and Tenon's capsule may show similar conditions in a varying degree to those found in traumatic panophthalmitis. It is very often impossible to demonstrate either emboli or micro-organisms.

Prognosis as to the recovery of the eye is hopeless even in the indolent painless cases; the eyeball becomes atrophic. If suppuration destroys the contents of the eyeball and they are evacuated, phthisis bulbi results, the eye usually remains quiescent and harmless, and may be allowed to remain in the orbit. But if the intraocular membranes are not entirely destroyed and the sclera is not extensively ruptured, atrophy of the eyeball results, which, on account of the tension on the intraocular membranes by contraction of the exudate, may give rise to repeated attacks of inflammation, and even sympathetic inflammation; such an atrophic globe must be promptly removed.

"The prognosis as to life is good in monolateral cases, uncomplicated by metastasis of septic emboli elsewhere in the body. Bilateral cases are generally attended with a fatal issue."

The treatment includes disinfection of the parturient tract, evacuation of the bowels, constitutional alterative and tonic remedies, nutritious and easily digested food, cold sponging, antipyretics, and the evacuation of pelvic abscesses.

"The chief local ocular treatment should be directed to the relief of pain and reduction of inflammation. Instillations of atropin and the application of hot compresses are first indicated. These failing, the sclera should be incised between the tendons of the external and inferior

recti muscles, and the pus evacuated. The opening in the globe may be packed with gauze and the cavity irrigated several times a day with a germicidal solution.

Even under the most rigid antiseptic precautions, enucleation during the active stage of inflammation is not free from the danger of purulent meningitis. The bloodvessels and lymphvessels of the orbit being extensively opened invite infection to the brain. Even evisceration of the eyeball has been followed by a fatal meningitis. However, this complication has been known to follow panophthalmitis when no operation was performed. Some ophthalmic surgeons advise the routine practice of operating at any stage of the inflammation; but in view of the possible dangers, and the perfect relief given by simple scleral incision, this treatment has not been adopted by conservative ophthalmic surgeons."

The writer adds the clinical history of a case and the pathological report of the examination of the enucleated globe.

The Value of Methyl Blue as a Local Application.

COOMES, M. F., Louisville. (*Amer. Journ. of Ophthalm.*, June, 1901.) The writer has been very favorably impressed with the value of methyl blue as a local application in various ocular affections. He has used it for years in purulent conjunctivitis and found that it acted as well as any agent at his command; he applied it two or three times a day; it does not stain the cornea permanently. In corneal ulcers it not only serves as means of diagnosing the presence of such defects of tissue, staining and thus defining the outlines, but it acts as an efficient germicide. Dr. Coomes thinks methyl blue is a most valuable agent that has been overlooked, and the object of his paper is to advocate a more extensive use of this remedy.

The Evolution of the Color-Sense.

GREEN, F. W. EDRIDGE, London. (*The Lancet*, March 30, 1901. Report of March meeting of the Oph. Soc. of the United Kingdom.) Dr. F. W. Edridge-Green said the facts of color-blindness threw a good deal of light on the evolution of the color-sense. Cases of color-blindness might be divided into two classes, quite separate and distinct from each other, though both might be present in the same person. In the first class there was light as well

as color loss. In the second class the perception of light was the same as in the normal sighted. Many color-blind persons belonging to this class had a sight perception much more acute than was found with most persons having normal color perception. Color-blind individuals belonging to this class could be arranged in a series. At one end of this series were the normal sighted and at the other the totally color-blind. Dr. Edridge-Green had classified them in accordance with the number of colors which they saw in the spectrum as pentachromic, tetrachromic, trichromic, dichromic, and monochromic.

All the facts which could be gained from the study of museums and literature pointed to the view that the sense of light was developed first and then the sense of color, those waves which differed from each other most physically being first perceived as different—namely, red and violet. It was obvious that if a certain portion of the visual centre were set apart for the perception of color, when it was very small and ill-developed, it would only be able to perceive differences of considerable magnitude; but as more cells were added to the centre greater and greater power of perceiving differences arose. Each cerebral cell might at first have been connected with many optic nerve-fibres, and the number gradually diminished as evolution proceeded. It need only be assumed that the nerve impulses differed in quality—for instance, in wave length—just as the waves of light differed physically in wave length, and that when a wave impulse of a certain character acted on a cerebral cell it gave rise to a corresponding sensation of color within the range of perceiving differences possessed by that cell. It was obvious that if the nerve impulses did not differ in quality one could never have a sensation of color. The spectrum was therefore first seen as grey, then with a tinge of red at one end and violet at the other.

As the color-sense developed it was not necessary that the rays should be so far apart before a difference was seen, and so the grey band gradually diminished until it entirely disappeared and the two colors met in the centre of the spectrum. A third color, green, then appeared at the central point. Then yellow appeared, making four colors; then blue, making five; and finally orange, making the

normal six. In some persons evolution had proceeded further and seven colors were seen, there being two colors between the green and violet instead of one. It was found that paintings were first monochromatic, then red and violet were used as colors, then green, then yellow, then blue. Homer's color vision was of the degree just preceding total color-blindness. The description by different authors of the rainbow as having one, two, three, four, five, six or seven colors was very characteristic. These facts showed that color-blindness was only an example of an earlier state in the development of the color-perceiving centre.

A Method of Preserving Eye Sections in Museum Jars.

WATSON, J. WILLIAM. (*Journ. of Eye, Ear and Throat Diseases*, April, 1901.) "The following method of preserving microscopical specimens of eyes has been in use for some time by Mr. C. D. Marshall at the Royal Ophthalmic, London, and is the one pursued at the Presbyterian Eye, Ear and Throat Charity Hospital. It is a quick process of placing the eye in portable shape and yet retaining its important characteristics.

"Immediately after enucleation the eye is placed in tap water for about one-half hour. During this time any shreds of tissue are cleared away so as to thoroughly expose the sclera. It is then carefully wrapped up in oiled silk and placed in a freezing mixture of ice and common salt. The mixture should be placed in a cullender, so as to aid the easy escape of the water formed by the melting ice. If it is desired to preserve the cornea clear, the eye should be cleaned as quickly as possible before freezing, as water in a very short time produces opacities in that region. The freezing process usually requires about two hours. The eye should be frozen solid, and should give a sharp click when dropped on a solid table. No time now should be lost in making the section.

"Its plane having been previously determined, the bulb is divided by a thin sharp knife. The two pieces are placed in water to thaw out. As soon as the ice is melted, the desired half is put in a solution of water and glycerin, equal quantities of each, while the other half can be hardened in a 10 per cent. formalin solution, so as to make microscopical slides.

"After six hours, the section is carefully transferred to pure glycerin. It must now be watched, for in case the sclera shows a tendency to curl up, the eye must be placed in a weaker solution of glycerin. When it has retained its shape in unadulterated glycerin for ten hours it is then ready for the permanent mounting in glycerin jelly.

"Glycerin* jelly is made as follows: An ounce of pure commercial gelatin should be soaked in eight ounces of water for 15 minutes. Then place in an oven to melt, using a porcelain basin to prevent burning. After melting add the whites and shells of two eggs and gttxx of carbolic acid, to make antiseptic.

"This combination is now boiled for half an hour, care being taken to stir it continually. After removing it from the fire, eight ounces of glycerin are added. The solution is now ready for filtering. This is the most tedious part of the process, as it is necessary to maintain a temperature of about 110° Fahrenheit, effected by means of the thermostat, or, if that is not available, a corner of the kitchen range will serve the purpose. Most of the debris can be removed by passing the solution through a coarse towel or a piece of flannel. It is then passed through filter paper (two thicknesses) at the temperature above described. The filtrate should be clear and transparent.

"Glycerin jelly can be made up in large quantities, provided enough carbolic acid is added to make it perfectly antiseptic. It is, of course, remelted each time that it is used. Instead of doing this any harm, it appears to remove some of the water by evaporation, which possibly makes the gelatin congeal more quickly. It should not be boiled, and should be placed in a warm place only long

*Although credit must be given to Priestly-Smith for originally preparing eye specimens in glycerine jelly, the advent of formaldehyd gave opportunity for Americans to improve upon his method. Many American ophthalmologists have large assortments of eye specimens prepared in a similar manner as in the foregoing. The editor has himself, several years ago, published descriptions of the process through which the specimens are prepared. (See Würdemann, "Illustrative cases showing indications for enucleation of the eyeball with macroscopic and microscopic photographic illustrations from specimens. *Annals of Ophthalmology*, Oct., 1897. "Directions for Preparation of Glycerin Jelly, and Macroscopic Eye-Specimens." *Trans. Wis. State Med. Soc.*, 1898).

enough for it to melt. Should any deposit appear, it will have to be refiltered, at the same time adding a few more drops of carbolic acid.

"The section of the eye is now removed from the pure glycerin to one of the museum jars. Those with lenses are sometimes used, thus magnifying the object, but I think the plain are preferable and are also cheaper. The glycerin jelly is poured into the jar over the specimen. When the jar is full, the eye is turned over carefully to prevent the appearance of bubbles. Should the eye show a tendency to float, it must be kept down by light weights until the jelly has hardened. An hour later the little cover can be sealed on with Canada balsam. As soon as this is hardened, depending upon the quantity used, the eye is ready for museum purposes. The caution to keep the specimen in a cool place is hardly necessary. The time usually required by this method is about six days."

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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Quarter Ending June 30th, 1901.

Treatment of Blenorrhea and Diphtheria of the Conjunctiva.

PROF. SCHMIDT-RIMPLER. (*Klin. therap. Wochenschrift*, Nr. 9, 1901. *Wochensch. für Therapie und Hygiene des Auges*, Nr. 35, 1901.) According to Schmidt-Rimpler the Créde method has accomplished little or nothing toward averting ophthalmia neonatorum in quite a number of localities. Generally however the eyes were not cleaned a single time. And in a number of cases in spite of the rules being properly observed blenorrhea made its appearance without being traceable directly to the gonococcus. The author throws discredit upon the law with respect to the Créde method and expresses the opinion that blenorrhea is not caused exclusively by the gonococcus. As regards treatment he is a firm believer in the efficacy of frequent irrigations with chlorine water. When astringents are necessary he thinks that most of them are equally good and in intense cases they should be employed. One can not always avoid small corneal opacities, and when extensive involvement of the cornea is seen it must be attributed to kerato-malacia. The chief treatment is irrigation. In the case of adults however blenorrhea as a rule is to be attributed to gonorrheal infection and it has a rather doubtful tendency to get well. He advises closing up the healthy eye in this class of cases and he does not think

that the instillation into this eye of silver solutions is advantageous or rather a safeguard. He advises frequent irrigations of the affected eye with weak solutions of kali. hypermang. lukewarm in temperature. Cold applications are indicated and generally ice when the lids are much swollen and this should be kept up for two hours at a time. He advises the kali. hypermang. irrigations in the treatment of diphtheria of the conjunctiva.

Corneal Erosions and Their Consequences.

VON REUSS, PROF., Vienna. (*Centralblatt für prak. Augeneheilk.* Marz und April 1901.) The author describes a variety of corneal erosion which is not unfrequently the result of a finger nail scratch. The patient gets apparently well but some mornings after he will awaken with decided pain in that eye. This pain disappears after an hour or so but re-appears on awakening the next morning. The usual methods including fluorescein reveal absolutely no break in the corneal epithelium. This condition of affairs may continue for weeks and even months. The author attributes it to a loosening or separation of the union between the cornea and epithelium. He reports a number of cases illustrating the condition and confirming his interpretation of its nature. When the erosion is fresh a compress bandage is applied and kept on for at least two weeks and a two per cent. solution of cocain is used several times daily when the eye is very painful. Several times during the day a little boric acid salve is introduced into the conjunctival sac and when these cases are so treated he has never seen a relapse. In cases however where the patient apparently gets well immediately after the injury, but some days later suffers pain on awakening and when this has been going on for several weeks he removes the epithelium over the site of the erosion and allows entirely new epithelium to reform. In this way he has gotten complete healing. Cases in this last category always present outward and visible signs of corneal involvement generally a greyish point but fluorescein produces no discoloration, thus showing that the trouble lies beneath the epithelium. The compress bandage and boric ointment are also employed as in the first class of cases.

Albargin.

BORNEMANN(*Wochenschrift für Therapie und Hygiene des*

Auges, No. 30, 1901) recommends this agent in gonorrhoea and thinks it is undoubtedly superior to all other remedies in this affection. It is in every sense more far reaching in its effects upon the gonococci. Like protargol it is free from irritating properties and in some respects it is superior to the latter drug. It is a white powder soluble in water and does not decompose on exposure to light, so it may be kept in ordinary glass bottles. The solutions give a neutral reaction. The silver in this product as it is in protargol is so to speak masked though not to the same extent as in protargol. It is highly recommended whenever we have a gonorrheal infection, when we would, in other words use either silver nitrate or protargol. It is usually employed in 2 per cent. solutions.

Spontaneous Healing in a Case of Conjunctival Tuberculosis.

LEVY, DR. A., Montreal, Canada. (*Klinische Monatsblätter für Augenheilkunde*, Mai, 1901.) The question as to whether conjunctival tuberculosis can get well of itself has been the subject of much discussion. Horner, Brettau, Fuchs and others suggest the possibility of such an occurrence but do not give us any positive date in this connection. Eyre is of the opinion that the disease shows no tendency, no spontaneous recovery. Levy's case was that of a child who had a cervical abscess and from this point the conjunctiva was infected by the carrying over of the pus to the free lid border. At first the inflammation of the conjunctiva closely resembled diphtheria, but it later proved to be unmistakably tuberculosis and the parents were advised to have an operation performed, but this they refused. A small particle of the diseased conjunctiva was introduced in the anterior chamber of a rabbit and in a few weeks a typical tuberculous iritis resulted. The parents refused operation and took the child away. Some months later when the child was again seen there was complete healing of the process. The conjunctiva of the lower lid showed some scars but otherwise it was normal and it was no longer possible to see any nodules which have entirely disappeared during the past year.

Suprarenal Extract in Spring Catarrh.

DR. PERRET. (*Die Ophthalmologische Klinik*, 5 März, 1901.) The author reminds us of the obstinacy of this affection the chief objective symptom of which is the in-

jection of the conjunctiva. Inasmuch as the suprarenal extract is a remedy preeminently valuable in producing local anemia he thinks it clearly indicated in spring catarrh. The remedy must be used freely and often, and he states that employing it in this manner he has seen all the symptoms of the disease rapidly disappear with the exceptions of the nodules or deposits in the upper lids. Those around the corneal border flattened out and became hardly noticeable not more so than an ordinary arcus senilis. He reports one case in which the result was most gratifying but he confesses that it is not improbable the disease will reappear a year later with the commencement of warm weather.

The Bacteriology of the Conjunctiva After Removal of the Tear Sac.

DRS. PLAUT and von ZELEWSKI, Rostock. (*Klinische Monatsblätter für Augenheilkunde*, Mai, 1901.) These investigators have recently made some very interesting observations upon a number of persons from whom the tear sac had been removed. Forty conjunctivæ were examined. Of these forty, thirty, clinically speaking, were normal. The interval between the operation and the time of the experiment varied from ten days to seven years. The time, however, which elapsed after the operation seemed to have no effect upon the number and character of bacteria which were found in the conjunctiva certainly in so far as the pyogenic bacteria were concerned. For example a large number of relatively virulent staphylococci were found in a case where the sac had been extirpated one and a half years previously, and in one case the pneumococcus was found where the sac had been extirpated the year before. Even in the conjunctivæ which were quite pale bacteria were just as numerous as in those which were red. Epiphora was entirely absent in two cases, slight in sixteen cases, moderate in nine cases and pronounced in only three. All of the thirty healthy conjunctivæ were rich in bacteria. The investigations show pretty conclusively that when the tear sac is removed there is a considerable increase in the number of bacteria in the conjunctival sac. The increase in the number of bacteria did not heighten clinically speaking the infectiousness of the healthy conjunctiva. Pyogenic, virulent

bacteria were just as rare as in cases where the sac was present. If virulent germs were present they were in greater numbers in cases where the sac had been removed than were not. We must take care not to exaggerate the purifying and irrigating action of the tears in warding off infection for we should remember that infection of the eyeball after removal of the tear sac is exceptional. These observers do not think that the evil effects of the bandage after cataract extraction (in comparison with the open treatment) are to be attributed so much to the increase in the number of bacteria as to the mechanical irritation and to increased pressure. They found that after extirpation there was relatively speaking a greater increase in the number of xerosis bacilli than in other bacteria and that too without any pathological change, these bacteria being found in great numbers, a fact which leads them to conclude that they were dealing with non-malignant Loeffler bacilli which only become pathogenic under certain conditions. The germicidal properties of the tears play in their opinion a very insignificant rôle.

Three Cases of Cataract from Lightning Stroke.

DR. PREINDLSBERGER. (*Wiener Klinische Wochenschrift*, 1901, 13.) Two of the cases were brothers, eleven and thirteen years of age, who were standing at a window during a thunder storm. Both fell unconscious, the younger remaining so for two days. For several days after this they saw only sparks of light in front of the eye but gradually the vision improved but again diminished. There was no external evidence of eye trouble but the ophthalmoscope showed well marked and diffuse clouding of the lenses with here and there thicker or denser opacities and right in the centre up against the anterior capsule there was a circumscribed dense clouding about the size of a millet seed. Fingers could be counted in three feet. Discission was performed and good vision resulted. There was practically no difference in the condition of the other boy and discission was also successfully performed on him. The third case was that of a man twenty-four years old who was struck by lightning and who remained senseless for ten minutes. The visual disturbance did not make its appearance for several months later and then in the shape of slight irritative symptoms. In a few months

the clouding was plainly visible. A successful extraction was performed on this patient. It is interesting to note that the other eye was unaffected.

The Introduction of Iodoform Rods into the Anterior Chamber.

PROF. GOLDZIEHER, Budapest. (*Centralblatt für prak. Augenheil.* Marz, 1901.) The author refers to this method of disinfecting the anterior chamber employed by Haab. He reports several cases as follows: The first case was a severe penetrating wound of the eyeball from a small piece of steel which was extracted with the magnet from the vitreous. It should be said here that the anterior chamber was full of blood and the eyeball was collapsed. . . . At first enucleation was advised but he determined to test the tolerance of the eye for the iodoform rods. A little rod was introduced into the vitreous through the wound. The blood quickly disappeared from the anterior chamber, the eye healed painlessly and the patient was discharged with a comely and unirritable eye. The next case was one of serpent ulcer which came to hypopyon. The pus was evacuated and an iodoform rod was introduced into the anterior chamber. There was no reformation of pus and the eye healed rapidly. In the other three cases there was more or less corneal involvement with pus in the anterior chamber and in all of these he obtained excellent results with the iodoform rods. He thinks that the treatment is perfectly safe and he has never seen objectionable reaction follow, on the contrary the immediate effect was always distinctly beneficial. In several of the cases where there was pain and extensive corneal infiltration the introduction of the rod was followed by cessation of the pain and a practically clear cornea was obtained. The method he thinks is worthy of praise and is calculated to do great good in certain cases.

The Retinal Changes in Chronic Leucaemia.

PICK, DR. L. Königsberg. (*Klinische Monatsblätter für Augenheilk.* Marz, 1901.) There are two kinds of changes to be seen: 1st, retinal patches and 2nd, hemorrhages. The changes which are most frequently found are retinal deposits or areas of sclerosis which are generally found in the vicinity of the papilla and close to the blood vessels. These areas are of various sizes, shapes and shades and may closely resemble the changes seen in

albuminuric retinitis. Hemorrhages are less frequently seen and are usually found at the posterior pole of the eye and sometimes in the very periphery of the fundus and appear to have no local connection with the blood-vessels. The author then analyzes a number of cases of chronic anemia, which resulted from tumors, hemorrhages and from various intestinal affections, from tuberculosis and other troubles. His conclusions may be summed up as follows: In all cases of chronic anemia we will find retinal changes which will manifest themselves either as areas of sclerosis or deposits in the retina or as hemorrhages. These changes are practically constant in malignant tumors of the stomach and of other organs. Their etiology is not clear. Possibly they may be attributed to the action of toxins. Transient albuminuria can also lead to the same character of changes. In chronic nephritis analogous changes in the retina have often no serious prognostic significance while the typical pronounced albuminuric retinitis almost always means an unfavorable prognosis. Analogous to these retinal changes may be mentioned the lesions in the spinal cord which were described first by W. Minnich. The retinal changes have functionally little significance the most pronounced retinal degeneration often running its course without any subjective symptoms.

The Diplobacillus Conjunctivitis.

DR. NEDDEN, Bonn. (*Klinische Monatsblätter für Augenheilk.* Januar, 1901.) Nedden refers to the observations of Morax, Axenfeld, Peters and others in this connection and states that the disease for the past year or two has been unusually prevalent in Bonn, and in fact throughout the Rhine region. He has collected and analyzed a number of cases, five hundred in all. Most of these cases presented the picture which Axenfeld has called blepharo-conjunctivitis, a condition which is usually chronic and in which the lid conjunctiva, toward the lid margin, is reddened and somewhat swollen, while the conjunctiva of the ball shows little or no change. The secretion is generally scanty. There does not seem to be any connection or at least, a very slight one between the number of the bacilli and the quantity of the secretion for often an unusual amount of secretion is associated

with very few bacilli and the quantity of the secretion for often an unusual amount of secretion is associated with very few bacilli and vice versa. He then describes the morphology of the organism more with reference to whether it is encapsulated and he seems to think with Kruse that one should not lay too much weight upon the presence of a capsule as a certain means of diagnosis. He then describes another class of cases which run a very acute course and resemble closely those conditions which are caused by the pneumococcus and by the Koch-Weeks bacillus. The greater intensity of the conjunctivitis in these cases he attributes to a greater virulence of the organism, especially when the organisms are found in pure culture. The contagiousness of the disease was clearly demonstrated. The author found this organism in quite a number of cases of trachoma but of course he does not believe that it has any casual connection with the disease but was simply an accidental finding and the same may be said of phlyctenular conjunctivitis. The author studied various forms of keratitis and in seventeen cases he was satisfied that the keratitis was caused by the diplobacilli these latter being found in those cases where the conjunctivitis was of the very intense variety. The author then describes its occurrence in cases of *ulcus serpens* (twenty-three cases) and its possible relation to this affection.

It is rather interesting to note the fact that in no case of dacriocystitis was the diplobacillus found in the tear secretion while it will be remembered that Biard found this organism in the nose in twenty-eight out of thirty cases of this character. Weak solutions of hydrarg, oxycyanat and boric acid solutions seemed to have little or no effect. Solutions of zinc were always used and invariably with good results. Generally in four days after using the zinc solutions the conjunctiva would be free of bacteria though he advises the continued use of this drug for at least two weeks longer.

Obliteration of the Tear Sac and Its Significance for the Practitioner in Comparison with Extirpation of the Tear Sac.

DR. SCHEFFELS-KREFELD. (*Klinische Monatsb. für Augenheilk.*, April, 1901.) The author thinks that obliteration of the tear sac after the method of Pagenstecher is for the practitioner a more suitable operation than extirpation. It

is an operation which can be performed without general anesthesia and it leaves no visible scar. His method is as follows. The lower canaliculus is cut all the way up to the entrance of the tear sac and then the upper canaliculus is treated in the same way. Various movements, forward, backward, here and there are made with the knife for in this way all strictures are broken through at the entrance of the sac. When one can carry the knife down through the upper canaliculus into the bottom of the tear sac and then outward into the lower canaliculus with out any resistance one can feel that all strictures have been cut. Bleeding is controlled by tampon. For the cauterization he uses the Vienna paste. He takes a small quantity of the paste, molds it into a little ball about the size of a hemp seed wraps it with a thin layer of cotton and then introduces it into the bottom of the sac. In two minutes he removes the paste and the sac is cleaned out with cotton. After this the fundus of the sac is again cauterized and following this the sac is again packed with cotton. The eye is protected from the caustic by introducing a salve into the conjunctival sac and by having the patient rotate the eye outward.

The Treatment of Sympathetic Ophthalmia.

DR. HEUSE. (*Centralblatt für praktische Augenheilkunde*, April, 1901.) Heuse's communication is a report of four cases of sympathetic ophthalmia which were treated with large doses of salicylate of soda. In the first case the sympathetic inflammation had been present three weeks before Heuse started treatment. The removal of the injured stump apparently had no effect upon the sympathetic process. He then gave the patient seventy-five grains of salicylate of soda daily and in a week the eye was remarkably better. This was kept up for five weeks at the end of which time the eye was well. The second case was that of a boy fifteen years old. When very young he had lost an eye from a penetrating wound. When seen by Heuse he had serous iritis and vitreous cloudings in the other eye. The injured eye was removed and a piece of steel was found in the posterior part of the sclera. He was put on sixty grains of salicylate of soda and in two weeks all the inflammatory symptoms had subsided. The last case was that of a boy fourteen years old who had been wounded

in the right eye by a piece of steel. It was found necessary to enucleate this eye but unfortunately this was not done till after sympathetic disturbance had shown itself in the other eye. The enucleation was followed by marked improvement and Heuse did not think it necessary to use the salicylate of soda when suddenly the inflammation broke out afresh. He was given increasing doses of salicylate of soda up to seventy-five grains and in three weeks the danger seemed passed. Again a recrudescence of the trouble made its appearance when the deeper parts of the eye seemed to participate. The salicylate was continued for several weeks longer and when the boy was last seen there seemed a fair prospect for some sight. The author does not allude to the communication of Gifford in this connection.

Treatment of Excessive Blinking.

DR. WOLFFBERG. (*Wochenschrift für Therapie und Hygiene des Auges*, 28 März, 1901). The author mentions the various causes underlying this troublesome affection and regards it, of course, as only a symptom. His communication, however, relates to the treatment of those cases of blinking which may be simply a "bad habit." Of course, blinking due to conjunctivitis, and similar disorders, can easily be relieved; but it is different with the blinking which we meet with in those children who, for the most part, are irritable and anemic. He reports a case where just such a child struck his eyebrow accidentally against the edge of a table producing a small abrasion. A bandage was necessary for a few days, and when the bandage was removed it was found that the blinking had disappeared, and it never came back. The author always makes a trial of the bandage in this class of cases, and he reports two successes. His idea is that the vision in the eye which is being used (the other being bandaged) is so much disturbed by the incessant blinking that the patient is induced to make excessive efforts to overcome the bad habit, and succeeds. Maybe, too, it is comparatively difficult to blink with one eye while the other eye is bandaged. He also calls our attention to the fact that it is usually difficult to blink and whistle at the same time. It is interesting, he says, to notice a blinking child who is told to whistle. It will often be found that

the blinking will stop in a moment. Wolffberg simply offers these suggestions for treatment of this very troublesome affection and thinks they are worthy of trial.

Subconjunctival Injections.

DR. HAITZ, Karlsruh. (*Klinische Monatsblätter für Augenheilk.*, Januar und Februar, 1901). The author reports thirty-three cases of, for the most part, intraocular affections in which subconjunctival injections of either salt or mercury were employed (either sublimate or hydrarg. oxycyanat.) was employed. When the salt solution was used, generally a syringe-ful was injected, when the mercury was injected, a quarter of a syringe-ful was used the first three or four times, and then increasing on up to half a syringe-ful. The injections were made every two days and were always preceded by cocain anesthesia. The injections were made as far as possible from the border of the cornea.

The conclusions of the author are practically as follows: The injections are especially indicated in vitreous opacities and in central choroiditis. They are beneficial in all cases of postoperative infection and in amotio retina. The method is a harmless one and is generally painless. Two per cent. salt solution is employed. When one wants to get the special action of mercury the hydrarg-oxycyanate is used in place of the sublimate.

The So-Called "Springende Mydriasis." A Variety of Mydriasis which is Seen First in One Eye and then in the Other.

GESSNER, DR. G. (*Münch. med. Wochenschr.*, 12 Marz, 1901). Both König and Riegel have made communications upon this subject. We understand by this phenomenon a dilation of the pupil which affects alternately one eye and then the other, and that, too, by nominal light and accommodation.

The author then reports a case which runs as follows:

Nov. 10th, right pupil greater than left.

Nov. 11th, left pupil greater than right.

Nov. 12th, right pupil greater than left.

Nov. 15th. In the forenoon right pupil greater than left, and in the afternoon the left pupil greater than right.

Nov. 18th, right greater than left.

Nov. 19th, pupils equal.

Nov. 24th, right greater than left.

Nov. 25th, left greater than right, and so on.

This variety of mydriasis, according to some observers, is seen in those who have some organic trouble of the nervous system (Paralysis, tabes), and also in neurasthenia. It does not seem, however, that this phenomenon is apt to have any serious significance when unassociated with other symptoms, and when the pupillary action is normal.

Experiments Bearing Upon Reclination of Cataract.

DR. WASSILJEFF AND N. ANDOGSKY. (*Klinische Monatsblätter für Augenheilk.* Februar, 1901.) We know the history of reclination and how this procedure ranks among the earliest operations upon the eye. We know, too, that the principal reason for its final rejection was because the operation was more apt to be associated with serious complications than any of the operations for cataract. The experiments of the authors were performed upon rabbits. Twenty-four experiments were performed. It is very interesting to note the fact that the anatomical examination of the eyes upon which this operation had been performed showed that in nineteen cases out of the whole number (twenty-four) there was retinal detachment. In six cases there was irido-cyclitis and closure of the filtration angle, and in only three cases did examination fail to reveal serious changes. These experiments simply vindicate the position which modern ophthalmologists have taken with regard to this operation, namely, that it is a method that should have no place in ophthalmology nowadays.

The Ophthalmia of the New-Born in Its Clinical and Bacteriological Aspect.

DR. GROENOUW. (*Archiv. für Ophthalmologie*, LII Band, Heft I.) We all know that ophthalmia neonatorum is not caused exclusively by the gonococcus of Neisser as has been shown by Haab, Axenfeld, Chartres and others. Groenouw gives us an analysis of one hundred cases which were carefully studied. These cases comprised not only infants with pronounced blenorrhea, but also with simple catarrhal conjunctivitis. I need not describe in detail his methods, but will simply give his conclusions. The ophthalmia of the new-born, that is to say, the sim-

ple catarrh as well as the pronounced blenorrhea, are caused by various organisms. These organisms are gonococci, pneumococci, streptococci, bacillus coli communis, and perhaps also the yellow staphylococci, etc.

Although the severe cases of blenorrhea were generally caused by the gonococcus, nevertheless there were severe cases in which gonococcus was not demonstrable. On the other hand a gonococcus conjunctivitis can sometimes exist under the garb of a simple catarrh without any blenorrheic character. Blenorrhea caused by the gonococcus generally lasts longer and has a severer course than cases where this organism was absent.

Corneal ulcers were only seen in those cases where the gonococcus was found, and occasionally in the lighter non-blenorrheic forms. The best evidence of the gonococcus was obtained from a cover-glass preparation. The cultivation of the gonococci is not imperative as giving less satisfactory results than the cover-glass investigation. If the gonococci are not found either before the treatment has begun, or after considerable treatment with an antiseptic agent, the prognosis may be regarded as very good. After the secretion has stopped one may find for days and weeks gonococci in the conjunctival sac, in which cases the silver salts must be continued. It was found impossible to produce a blenorrhea in rabbits by inoculation with either cultures, or with some of the pus. In some of the cases organisms were found which are not usually classed among those which give rise to conjunctivitis. It may be said in conclusion that protargol in the treatment did not prove to be superior to nitrate of silver.

Disappearance of Epiphora and the Changes in the Lacrimal Gland After Extirpation of the Tear Sac

DR. B. TSCHERNO-SCHWARTZ, MOSCOW. (*Zeitschr. für Augenheilk.* Mai und Juni, 1901.) This experimental work upon rabbits lead the author to the following conclusions. 1. A certain time after the removal of the tear sac the epiphora will get less and finally disappear. 2. The epiphora can now and then reappear under the influence of irritation. Its intensity, however, stands in inverse ratio to the lapse of time after the operation. 2. The cause for the cessation of the epiphora after the removal of the tear sac lies probably in the compensatory atrophy

of the corresponding lacrimal gland. 4. The cessation of the lacrimation and the existence of changes in the lacrimal gland after removal of the tear sac would justify one in concluding that there is some sort of connection between the two organs.

The Etiology of Ophthalmia Neonatorum.

SCHANZ, DR. FRITZ. (*Zeitsch. für Augenheilk.* Juni, 1901.) The author has found that the disease which we have always regarded as an infection due to the presence of the gonococcus is in a large majority of cases unassociated with this organism. Possibly the first experiments to cast doubt upon the truth of this opinion were made under Neisser's direction. In ninety-two cases of blenorrhoea neonatorum the gonococcus was absent in twenty-nine cases while Widmark in one hundred and three cases found the gonococcus absent in thirty-nine cases. Klopstein in fifty-one cases of severe blenorrhoea found the gonococcus thirty times and finally Groenouw examined one hundred cases and found the gonococcus in only forty-one cases.

A number of other organisms have been found in this class of cases such for instance as the pneumococcus, streptococcus, Koch-Weeks bacillus, etc. Any of the last named organisms may produce a blenorrhoea with all the typical symptoms.

The Treatment of Asthenopia.

PAGENSTECHE, DR. HERMANN. (*Zeitschrift für Augenheilk.* Mai, 1901.) By asthenopia we understand a falling off in the efficiency of the eyes with unimpaired vision due to either accommodative disturbances, refraction or muscular anomalies, also to either a conjunctival affection or to a general neurasthenic condition. The author after describing the symptoms which are well known to us all proceeds to the treatment. While he lays great stress upon the importance of glasses in suitable cases he reminds us that by far the majority of anomalies of refraction do not lead to asthenopic symptoms and he warns us against overestimating the value of glasses in this class of cases. He speaks ironically of the good results obtained in America and England by the use of cylinder glasses. He seems to think that glasses should be our last resort. He speaks of making our hypermetropes prematurely presbyopic. By the constant wearing of convex glasses our

patient loses the power of accommodating for either the far or the near. He also cautions us for the same reason against giving the myope glasses for constant use unless absolutely necessary. He thinks that pure cases of muscular asthenopia are exceedingly rare and that they may be corrected by prisms in combination with proper sphericals and cylinders. He speaks in no uncertain tones against tenotomy, sentiments which the reviewer has long endorsed. He refers to a rare form of asthenopia which is due to a slight paresis of the externus. The patients do not complain of diplopia but that every thing swings before the eyes. For this affection he advises the use of prisms. He then refers to a very important form of asthenopia the so-called conjunctival asthenopia which is due to a more or less inflammatory condition of the conjunctiva. The changes in these cases are not to be found in either the upper or lower lid but are to be located after the closest inspection in the transition folds. In such cases our collyria leave us in the lurch and he advises the use of either the alum stick or the copper stick, or mild silver solutions all of which measures must be conducted with the utmost caution. The conditions of the transition folds to which he calls our attention are as follows. One condition consists in a very minute dark red swelling which lies between the folds and has its favorite seat in the neighborhood of the bulbar conjunctiva. The other condition consists in hardly noticeable grayish streaks which run in different directions through the transition folds. Both conditions indicate that the conjunctiva has been the seat of trouble for a long time. Such cases are benefitted with the alum stick. Another group of cases to which he refers is that where the patient complains of discomfort in the lids instead of in the conjunctiva. There is usually a feeling of burning and irritation about the lids. We meet with these conditions in those who are either anaemic, gouty or nervous and they are to be treated upon their etiological basis. Finally he discussed the so-called neurasthenic, hysterical asthenopia. These cases are of three kinds. First where we find great sensitiveness of either the one or the other eyeball or of both to the touch and where it is possible at times to even detect a slight elevation of tension. The second variety is characterized by

the existence of a circumscribed area of tenderness in the ciliary region. The third variety and the most important one is where we have increased sensitiveness of the nerves coming out of the orbit, especially of the supraorbital nerves. In all these cases massage is the most important factor in the treatment, massage of the eyeball and of the supraorbital nerves. He describes the technique of the massage which consists in forcible rubbing of the temples and of the forehead every day for at least four or five weeks for one or two minutes at a time. He also advocates massage of the eyeball. He has a poor opinion of electric massage. Reference is then made to the asthenopia which we meet with in women who are suffering with uterine troubles also to the asthenopia which is produced by troubles in the nares and accessory cavities.

The Treatment of Trachoma with Ichthargan.

FALTA, DR. M. (*Achiv. für Augenheilkunde*, XLIII, Heft II.) Ichthargan is much stronger in silver properties than most of the other silver products and possesses additional value in that we have the silver and ichthyol in combination. The author then describes the peculiar properties of this combination and goes on to report eight cases of trachoma treated with ichthargan which report shows that the drug is of no little value in the treatment of this affection. In only one variety of trachoma does ichthargan appear to be of no avail, and that is in that chronic form where the disease is characterized by a great deal of photophobia and in which there is a comparative absence of marked objective symptoms or at least where the latter are insignificant. In those cases, however, where there is corneal involvement we get the best results and the author reports prompt improvement in cases of pannus after three or four days and he regards it as almost a specific for pannus. The drug seems to possess all the marked germicidal properties of both nitrate of silver and ichthyol and also great powers of penetration. The application of ichthargan is usually followed by burning which lasts several minutes and sometimes hours. Children tolerate it better than adults. These unpleasant symptoms however disappear after the first few applications.

The product is used in from $\frac{1}{2}$ to 3% solutions. He concludes his report with further praise of ichthargan and

states that fresh cases of trachoma can be cured in from six to eight weeks.

A Contribution to the Bacteriology of Chronic Purulent Inflammation of the Meibomian Gland of the Lid.

MAKLAKOFF, JR., DR. A. A. (*Archiv. für Augenheilk.* XLIII, Heft I.) The author reports an interesting case of lid trouble of several years standing. The chief characteristics of the trouble were abnormal thickness of the entire cartilage dilatation of the openings of the Meibomian gland and the discharges of pus from the latter. The course of the disease was mild throughout without any marked inflammatory symptoms or vacillations. Bacteriological examination showed the presence of the same organism in both the nose and the pus from the Meibomian gland and proved to be an organism identical with the so-called bacillus mucosus of ozoena. The author states that this is the first instance of the ozoena bacillus having been discovered in the eye.

The Pathological Anatomy of Arcus Senilis.

DR. TAKAYASU, Japan. (*Archiv. für Augenheilk.* XLIII, Heft II.) The author's communication is probably the largest contribution to the pathology of arcus senilis. His studies were made on twenty eyes of persons from 50 to 90 years of age. After sections were made, he finds that the principal changes in the cornea consist in the presence, in the latter, of very fine granules. He describes very minutely the various histological characteristics of that part of the cornea occupied by the arcus, and he sums up his conclusions as follows: The little granules color readily in the so-called "Sudanlösung," while either a chalky or hyalin material is uninfluenced by this stain. The granules are stained black with osmium. The granules do not react to hematoxylin, eosin or to von Gieson's stain. Alcohol causes them to run together and disappear entirely. They are not to be found in preparations hardened with alcohol. He concludes that the granules are fat granules, and that the arcus senilis is nothing more than a fatty degeneration of the corneal substance.

A Contribution to Tenonitis Serosa.

DR. NICOLAI, Berlin. (From the eye-clinic of Prof. Greeff, *Berlin. Klin. Woch.*, 1901, No. 11, p. 290.) N. observed a case of serous tenonitis which set in simultaneous-

ly with articular rheumatism, so that it may be considered as a metastasis of the latter, according to the anatomical relationship of Tenon's capsules to the joints. It subsided under antirheumatic treatment.

A Case of Idiopathic Hemorrhage Between Retina and Vitreous.

ZIEGNER, DR. H., Halle-Giebichenstein. (*Berl. Klin. Woch.*, 1901, No. 13, p. 342.) In a man, aged 52, sudden impairment of central V of right eye to counting figures close by; a lamp appeared indistinct and red. Ophthalmoscopically (inverted image) a kidney-shaped hemorrhage, about 4 diameters of the disc long, $2\frac{1}{2}$ wide, downward and on the nasal side of the disc. Its convex margin was toward the periphery, the concave margin to covering $\frac{1}{3}$ of the latter. At the macula within the hemorrhage was a round spot which seemed surrounded by a wall of blood. There were 5 small white patches (probably fibrin) near the border in the lower portion of the effusion. The retinal vessels, which showed no changes, were covered by the hemorrhage and stopped short at its border. This, as well as the encroachment of the hemorrhage upon the disc and the erythropsia, left no doubt that the seat of the hemorrhage was between retina and vitreous. The radial artery showed arterio-sclerosis and the author attributes the disposition to the hemorrhage to sclerosis of the retinal vessels, although not noticeable by oph. examination. Subconjunctival injections of NaCl solutions favored absorption, so that after not quite two months V rose to 9/10, and after three months to 1. (In most cases published it lasted five to six months.)

Remarks on the Treatment of Naso-Lacrimal Affections.

DR. ALBRAND, Sachsenberg. (*Deutsche Med. W.*, 1901, No. 14, p. 214.) In light cases treatment with probes, sometimes permanent probes, as devised by Vulpius, yields almost ideal results. The author advocates the extirpation of the lacrimal sac, in chronic processes, with more or less profuse muco-purulent secretion, in fistula, affections of the periosteum and caries, after cauterizations or injuries of the inner canthus, in exulcerations of the lid borders from long-standing blepharoconjunctivitis, in old trachoma and its sequela, and in less severe cases from special reasons, e. g., laborers who cannot spend the time necessary for treatment with probes.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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ASSISTED BY

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(Quarter Ending June 30, 1901.)

Concerning the Indications for the Ablation of the Superior Cervical Sympathetic Ganglion in Cases of Glaucoma.

ABADIE, Paris. (*Archives d'Ophthalmologie*, March, 1901.) Abadie calls attention to the fact that, in those cases of glaucoma which are favorably influenced by an iridectomy, the pupil is always dilated and remains so after the operation. This, he says, is not, however, so apt to be the case in the chronic simple form of the disease. For this type he offers as explanation that the condition is due to a superexcitation of the superior cervical sympathetic, while in the acute varieties of the disease, this excitation arises from the intracranial sympathetic nerves. In accordance with this belief, the condition of the pupil he believes to be a safe guide as to whether iridectomy or ablation of the superior cervical sympathetic ganglion offers the greater hope of relief.

Visual Acuity From a Medico-Legal Point of View.

PECHIN, Paris. (*Archives d'Ophthalmologie*, March, 1901.) Pechin does not believe that justice is best served by employing the series of cards now in general use in Germany, they not giving the amount of visual acuity necessary for the performance of various occupations. Any degree of injury to the sight, due to the negligence of others, should, he says, be compensated for. This is so, he believes, even though the patient may retain an amount of vision which

may be considered necessary to perform his duties. The fact that the sight is impaired, he asserts, must always militate any employers against him. The cards, he thinks, are based upon the average of too small a number of patients to be accurate. All personal questions, which are always important, are lost sight of while attempting to adhere rigidly to any definite rules.

Certain Considerations Upon the Actions of Iridectomy in Glaucoma.

DAULNOY. (*La Clinique Ophtalmologique*, March 10, 1901.) As the result of investigations upon this subject, Daulnoy arrives at the conclusion that Abadie's theory of dilatation of the ocular vessels through the influence of the sympathetic system, is most tenable. In concluding his article he says:

1. It is impossible that iridectomy should relieve glaucoma simply through the establishment of a free communication between the anterior and posterior chambers.

2. Acute glaucoma is probably the result of a lesion of a part of the bulbar centre, producing dilatation of the arteries of the orbit, and in consequence, a reflex contraction of the chorioidal muscle which determines the hypertension.

3. Iridectomy acts very well in the following types of diseases: acute and subacute, with corneal disturbance and absolute remission between the attacks. The probable explanation of the action of the procedure probably lies in the destruction of the iridal plexus, and the consecutive reflexes acting upon the irido-cilio-chorioidal muscle.

4. In chronic simple glaucoma the lesion of the bulbar centre is different and acts more especially upon the trophic fibres.

5. Iridectomy has no effect upon chronic simple glaucoma. In such cases, and if a marked and prolonged treatment with eserine, associated with pilocarpin, does not give good results, sympathectomy, which, so far, has acted excellently, should be performed.

Apropos of Four Cases of Sympathetic Ophthalmitis.

GUIBERT, La Roche-sur Yon. (*La Clinique Ophtalmologique*, March 25, 1901.) Guibert cites four cases of sympathetic disease in which the injured eye had for many years not produced any trouble with its fellow, but finally

after some debilitating disease had given rise to sympathetic disturbance. In three of the cases, the injured organs were very much reduced in size from causes dating respectively fifty, thirty, and fourteen years. In three, the sympathizing eyes did not exhibit any signs of iridocyclitis. The writer presents these cases in support of Panas' belief that some general autointoxication is necessary for the establishment of sympathetic disease.

Hereditary Nystagmus Without Apparent Lesion.

JACQUEAU, Lyons. (*La Clinique Ophtalmologique*, March 25, 1901.) Two cases are described by Jacqueau, the patients being mother and daughter. In each there was a rotary nystagmus with a movement of the head in the opposite direction. The mother's vision was ten-fifteenths and the daughter's one-half of normal. The mother had a compound hypermetropic astigmatism with the major axis horizontal, while the daughter had a hypermetropia of one and one-half diopters. There was not any trace of hysteria or evidence of other general nervous disturbance. The author agrees with Knies in attributing this disease to some central lesion.

Orbital Heteroplasty by Grafting a Rabbit's Eye Into the Capsule of Tenon.

LAGRANGE, Bordeaux. (*La Clinique Ophtalmologique*, March 25, 1901.) In a brief communication, Lagrange calls attention to the fact that Rohmer's failure to successfully graft an animal's eye into the Capsule of Tenon in the human being should not militate against the operation as the technique was faulty. He says that the capsule should be free from blood before the eye is introduced, and that instead of closing by the purse string suture, the ends of the muscles should be carefully approximated and the wound closed by interrupted sutures.

He describes three cases in which he successfully grafted the eye of rabbits into Tenon's Capsule. At first there was a rapid shrinkage of the resulting stump until the grafted organ had reached about one-half of its original size. After this no change occurred. The resulting stumps were well formed and freely movable. In one instance the operation was a failure due likely, he says, to the fact that the grafted eye was too large, being taken

from an old rabbit in whom vitality was in all probability reduced. He believes that great care is necessary during the preparation of the case and the procedure. The capsule must be thoroughly clean and all hemorrhages should be arrested before the graft is introduced. In addition, before cutting the muscles, the sutures should be inserted into them for the purpose of drawing them together to close the wound. Further, the conjunctiva must be carefully closed with interrupted sutures and the eye selected should be from a young rabbit or from one of medium or small size. The conjunctival sutures may be removed on the tenth day.

Sub-Conjunctival Extraction of Cataract.

PANSIER, Avignon. (*Annales d'Oculistique*, March, 1901.) Pansier states that he was one of the first to revive this method which Desmarres employed in six cases. His results in a large number of instances have been satisfactory. He presents the same arguments for the methods that have been brought forward by others who have used it. During the procedure he employs a weak solution of cocain in a solution of suprarenal extract. This serves he says, to obtain a better anesthesia and prevents hemorrhage which is the only real objection to the operation. He makes a much wider "bridge" now than when he first employed the method.

Death After Cataract Operation.

TROUSSEAU, Paris. (*Annales d'Oculistique*, March, 1901.) Trousseau states that slight as the operation for removing the crystalline lens apparently is, there are undoubtedly a disagreeably large number of cases in which death has either directly or indirectly followed the procedure. He considers that a fatal issue is at times associated with exhaustion, or that it may be due to some cause, such as intoxication, from poor excretion or passive congestion of various organs, notably the lungs. Considering the condition from the clinical side, he closes his consideration of the subject with the following practical suggestions: 1. If an aged patient becomes agitated and delirious after an operation, it should give rise to uneasiness upon the part of the surgeon. 2. When the patient's tongue becomes dry and the quantity of urine voided be-

comes less, or particularly if there is anuria, there is cause for alarm.

Description of a Third Lid.

BITZOS. (*Annales d'Oculistique*, March, 1901.) Bitzos has seen a third eyelid in a 35-year-old man. He found that the semi-lunar fold formed a triangular appendage extending outward horizontally. It was three millimeters thick at its base and one millimeter thick at its summit. It had a cartilaginous consistence which was most marked at the base. It presented a smooth, healthy, dark-rose surface at its base, becoming more translucent at its summit. There were not any scars or hairs.

Comminuted Fracture of the Vault of the Skull Radiating to the Base, With Injury to the Right Occipital Lobe. Temporary Double Internal Ophthalmoplegia and Permanent Paracentral Scotoma of the Left Eye.

LOR. (*Annales d'Oculistique*, March, 1901.) The patient seen by Lor was a driver who was injured in a collision. Many spicules of bone, some of which had passed beneath the dura mater, were removed. The ophthalmoplegia lasted but a few months' time. In fact, only during a prolonged convalescence. The scotoma, however, which was not observed until near the end of this period, was permanent. It was triangular in form, with its base situated near the fixation point and its apex at the blind spot. One border of it, which ran from the apex, joined the base slightly above the horizontal meridian. The other side ran from the apex downward and outward to join the base about fifteen degrees below the upper border.

The author accepts Munk's hypothesis in regard to the explanation of the lesion, believing that the macular cortical centre was affected.

Spontaneous Resorption of a Cataract.

TROUSSEAU, Paris. (*Annales d'Oculistique*, March 1901.) Trousseau gives an interesting account of a cataract occurring in an eye upon which an iridectomy had been previously performed, for the relief of glaucoma, and which spontaneously absorbed. The patient was 55 years old and the cataract was soft. Several months were occupied by the process, which was nearly complete, leaving only an almost transparent membrane in one angle of

the pupil. With a plus twelve spherical lens the patient had a vision of two-thirds of normal.

Semiology of Orbital Hemorrhages of Spontaneous Origin.

MORAX, Paris. (*Annales d'Oculistique*, April, 1901.) Morax's case was that of a woman of sixty-eight years of age, who had always been accustomed to doing manual labor in the fields. She was suddenly seized (during a vacation) with pain in the right eye, accompanied with vomiting. She noticed that she was unable to open the eye. There was not any fever or feeling of illness. When she was seen by the author upon the same day, there was a marked exophthalmos of the right eye, with an almost complete loss of ability to open the lids. With this, there was a complete palsy of the corresponding superior rectus muscle, the power of the other muscles being so reduced that the movement of the globe was reduced to about ten degrees. The tension of the affected eye was possibly slightly below normal. Refraction showed a hypermetropia of one and a half diopters in the affected organ, which, after correction, allowed a vision of one-twentieth of normal. The left eye was emmetropic with a vision of five-sevenths of normal.

During the night following the attack and the succeeding one, the pain recurred, each recurrence being accompanied with vomiting. Two days later all signs of the trouble disappeared. The patient then returned to her home and was not seen again.

The author attributes the disease to a venous hemorrhage, believing that the richness of the anastomoses of the orbital veins explained the absence of any circulatory changes in the eyeball.

Amaurosis and Amblyopia in Renal Lithiasis and Acute Uricemic Optic Neuritis.

ZANOTTI, Vercelli. (*Annales d'Oculistique*, April, 1901.) Under the first class of cases, Zanotti ranges three. Their histories in detail present strong evidence as to the correctness of the author's diagnosis. In brief, the symptoms shown by them may be summed as follows: A pronounced attack of the visual disturbances which in a few hours' time, at the most, proceed to blindness. In every instance these troubles coincided with an attack of nephritic colic, which ended with the expulsion of a calculus. The two

eyes were affected simultaneously, the lesions attaining to nearly equal degrees of gravity. There was an irregular reduction of the visual fields, with central scotomata reaching in some cases to a width of from fifteen to twenty degrees. The pupils were enlarged and the irides failed to react but very slightly; this feebleness of reaction persisting for several days in spite of a return of vision. There was intense photophobia.

In certain cases the blindness was quite persistent, giving place in time to a pronounced visual defect.

There was intense itching with a sensation of marked smarting of the lids, without any secretion from the conjunctiva or hyperemia of the lids. Binocular neuroretinitis existed, the papillae being hyperemic, and their edges invisible. The retinal arteries were small and the corresponding veins were dilated. The retinae were edematous and infiltrated by an exudate. There were not any hemorrhages, save in a single instance. The final ending, he says, is always optic atrophy. The patients do not complain of headaches and there is not any ocular pain.

The second class of cases is represented by seven cases. In all, an acute optic neuritis followed exposure to cold. In none of the cases was it possible to detect the presence of albumin or sugar in the urine. In but one could syphilis be demonstrated, and, in that case, the condition of the eyes became worse by the employment of antisyphilitic treatment, and bettered under antiuricemic therapy, though sooner or later blindness ensued. In all of the cases, during the attack, the urine was highly acid, and, at times, depositis of uric acid could be determined.

Two Cases of Filamentous Keratitis.

MONESI, Modena, (*Annales d'Oculistique*, April, 1901). Monesi contributes two cases of this well-known condition to the literature of the disease. His observations both macroscopically and microscopically coincide with those that have been made by other observers.

Ciliary Blepharitis: Its Cause and Treatment.

GALEZOWSKI, Paris. (*Recueil d'Ophthalmologie*, April, 1901). In conclusion, Galezowski says: 1. Every case of ciliary blepharitis, whether of glandular origin or phthiariatic in type depends in great part upon strictures or

obliterations in the lacrimal passages; 2. Intractable cases of ciliary blepharitis, either simple or complicated with deviation of the palpebral border, conjunctivitis, or ulcerous herpetic keratitis, etc., although of old standing, may be cured by catheterizing the lacrimal passages; 3. Cases of blepharitis or blepharoconjunctivitis with granular lids may be ameliorated very rapidly by enlarging the lacrimal point and the lacrimal canal.

The author has devised a form of syringe for this purpose. The barrel is made of glass and the piston is made of rubber. The canula is very fine, with the end cut diagonally, somewhat like that of an ordinary hypodermatic needle. The needle is attached to the syringe by a form of bayonet lock.

Colobomata of the Upper Lid with Cerebroid Glioma of the Orbit.

DE WAELE AND LEWUILLON, Gand. (*Annales d'Oculistique*, May, 1901.) De Waele and Lewuillon first saw the subject of these deformities when it was but one day old. The upper lid of the left side was divided into three portions, the outer one being subdivided by longitudinal fissures. The eyeball was replaced by a subconjunctival tumor. There were some slight abnormalities of the left side of the face.

When the child was a year old the tumor mass was removed. The patient died from convulsions one month later, so that it was impossible to state whether there would have been any return of the growth or not. Examined under the microscope, the neoplasm was found to be intimately connected with what was in all probability a rudimentary optic nerve. There was a fair sized cyst with several pseudocysts, the latter being due to degenerative processes. Remnants of illy formed retinal, scleral, and lenticular tissue were found. The structure of the mass was largely that of a psammoglioma. The authors agree with Van Duyse in attributing such a deformity to adhesions with the amnion. The commencement of the trouble they think probably dated back to the fourth or fifth month of fetal life.

On the Treatment of the Ocular Complications of Variola.

DUFOUR, Lausanne. (*Annales d'Oculistique*, May, 1901.) Dufour reports one case of corneal complication

successfully treated with subconjunctival injections of a one to one-thousand strength solution of bichloride of mercury. He accompanies the report with a general description of the ocular complications of the disease.

. **Varicello Ophthalmitis and Its Treatment.**

COURMONT AND ROLLET, Lyons. (*Annales d'Oculistique*, May, 1901.) These authors state that after having seen three cases of blindness the result of this trouble in previous epidemics, they commenced the employment of a one to five hundred strength solution of methylene blue. Among six hundred and ninety-one cases of small-pox they found forty-five cases with complication of the conjunctiva and cornea. This method of treatment in this epidemic was so successful that they did not lose a single eye.

Two Cases of Unilateral Ophthalmoplegia of the Form Called Nuclear.

MAILLARD AND WICKI, Geneva. (*Annales d'Oculistique*, May, 1901.) The first case seen by Maillard and Wicki was that of a married woman aged twenty-eight years. Both she and her husband denied having syphilis, and no sign of the disease could be detected on their persons; but when the history of three pregnancies and an examination of resulting children was made, suspicion that the patient had the disease become very strong.

The ocular symptoms, which were ushered in with severe headache, were localized in the region of the left eye. In less than a month's time there was almost complete ptosis of the left eyelid and the eye was fixed directly ahead. Its lateral movements were completely abolished, but a slight motion was possible in an up and down direction. Downward movement was accompanied with a rotary motion, showing involvement of the superior oblique muscle. During attempts to raise the eye again this rotation was reversed. The right eye appeared normal. Both irides reacted equally well to light and accommodation, which latter function was unimpaired. Vision in each eye was normal. No other symptoms, except some deafness due to a catarrh of the left middle ear, were noticed. Large doses of mercury soon established a cure.

The second case was that of a soldier who was suddenly stricken with total external ophthalmoplegia of the left

eye, with paralysis of accommodation, although the iris reacted to light. The right eye was normal. The man admitted that he was an old syphilitic. As in the other case, there were no other signs of disease. This case did not make such a good recovery as the first one.

The authors state that from the unilaterality of the paralyzes they exclude any lesion above the bulboprotuberential nuclei. They believe that the pain in the first case could not be attributed to a lesion of the nuclei, as such disturbances are painless. Moreover, they say if the seat of disease was in the nuclei it was at least remarkable that nuclei situated so far apart should be simultaneously attacked, while those lying between could remain intact. This thought, with a careful study of the symptomatology of the disease brings the authors to the conclusion that the two cases were both due to a toxic form of neuritis.

Corneal and Iridal Affections of Malarial Origin.

LEPRINCE, Bourges. (*Annales d'Oculistique*, May, 1901.) Leprince reports a very severe case of dendritic ulceration of the cornea which was undoubtedly due to malaria of quotidian type. A cure was established after a long term of appropriate local and general treatment, aided probably by the oncome of winter. A short review of the literature bearing upon the subject accompanies the report.

Pathological Anatomy of Melanotic Sarcoma of the Uveal Tract.

LAGRANGE, Bordeaux. (*Archives d'Ophthalmologie*, April, 1901.) Lagrange sums as succinctly as possible the results of eight personal observations, showing what he found of interest in the structures, particularly in regard to the pigmentation of such neoplasms. He says: 1. As we have encountered round and fusiform-celled melanotic sarcoma, alveolar sarcoma, and angio-sarcoma, a classification from such a standpoint should not be accepted to the letter, as many such sarcomata contain both round and spindle-shaped cells. Three times they found the point of origin to be in the layer of the veins. In structure, the most interesting growth was one which was remarkable for the relations that existed between the pigmented and non-pigmented portions.

They further state that from careful study it is apparent that the pigment arises from retinal epithelium, and con-

sequently, they say, the growth is in great measure an epithelioma. In order to determine the origin of the pigment, they, after having tried the ordinary reaction methods, found it very difficult to determine the exact rôle of hematic transformation in pigment formation. They believe that the blood plays the major part in the pigmentation of melanotic tumors in general, and of sarcomata of the eye in particular. They state, however, that this rule cannot be definitely determined until histochemistry shall have made known the process of pigmentation in furnishing a laboratory method that permits an exact knowledge as to the hematic origin of melanosis. This process, they believe, is yet to be found, and for the present they think it is necessary to be contented with the particular statement just made. In certain of the studied tumors they say they have succeeded in obtaining an iron reaction; but the great majority of the pigment grains found by them remained inactive to the ferrocyanide of potassium test, and for this reason they considered themselves unable to state whether an iron reaction had been obtained or not. Nevertheless, they believe in general that Fuchs is correct in his belief as to the origin of the pigment.

In nearly every case the greatest number of pigmented cells were found in the presclerotic region in a position corresponding with the lamina fusca. In this place normal pigment cellules in the process of evolution and proliferation can be seen. In regard to the conditions which unite the melanotic cells and the vessels may be explained: 1, By the hematic origin of the cellules, formed around the vessels at the expense of the blood itself; 2, by the appetite that the chromatoblasts have for oxygen that the normal mobile pigmented cells endeavor to seek for in the vessels. In proof of this they assert that there remains only a reagent which will be able to furnish a proper interpretation of the condition.

**Particular Indication for the Combined Method of
Extraction.**

TERRIEN, Paris. (*Archives d'Ophthalmologie*, April, 1901.) Terrien regards simple extraction as the operation of choice, but admits that there are a great number of indications for the employment of the combined procedure. Among these he includes the capsulolenticular form of

cataract. If the case, he says, is diagnosed as such, an iridectomy should be done immediately after completing the incision. If, on the other hand, the capsular involvement is not detected until after the removal of the lens, an iridectomy with the removal of the capsule should then be performed, in spite of the difficulty of the procedure at this stage. The author gives a detailed account of one case of large hernia of the iris resulting from a neglect to perform iridectomy, and has collected four similar cases from ophthalmic literature.

Actinomycosis of the Lacrimal Canalicula.

TERSON, Toulouse. (*La Clinique Ophthalmologique*, April 10, 1901.) This disease, Terson says, appears in a much milder form in the canalicula than in any other part of the body. In the case reported by him, the only symptoms noted were epiphora, dilatation of the punctum, a slight mucous discharge from the sac upon pressure, and a swelling of the lid in the region of the canal. On opening the canal, several ovoid masses varying in color from white to yellow, were expelled. In a few days' time, the patient returned to her home cured.

Hereditosyphilitic Orbital Periostitis; Late Manifestation, Simulating Lacrimal Ethmoidal Affection, Diagnosed by the Aid of Rudimentary Ophthalmoscopic Stigmata.

ANTONELLI, Paris. (*La Clinique Ophthalmologique*, April 10, 1901.) The form of periostitis seen by Antonelli was located slightly above and to the nasal side of the lacrimal sac. On opening the swelling, a slight discharge escaped. The most probable explanation according to the author, seemed to be that the disease was the result of ethmoidal disturbance, although there were not any signs of much trouble. The author states that he was led to the current etiology of the condition by finding rudimentary hereditosyphilitic stigmata in the fundus of the eye.

Ocular Burns by Hot Iron and Melted Resin.

BOULAI, Rennes. (*La Clinique Ophthalmologique*, April 10, 1901). Two interesting cases are reported by Boulai. In each case the injury was of a severe nature. The treatment did not practically amount to anything, owing to the carelessness of the parents of the children. Recovery, however, was perfect. The first patient, a child, touched its cornea with a red hot iron. The second fell against a

lighted resin candle, the resin being allowed to remain in the eye for four days' time before any medical advice was sought.

Clinical Researches Into Strabismus of the New-Born. Does Congenital Functional Strabismus Exist?

SERINI, Paris. (*Archives d'Ophthalmologie*, May, 1901.) Serini finds that congenital functional strabismus does exist; that it is more frequent in primiparas than in multiparas; and that a long labor and a prolonged period of expulsion increases its frequency. These results, he says, are based upon a long series of observations in the Maternity Hospital of Paris. Nearly 50 per cent. of the first-born infants, he asserts, showed a strabismus, which was either alternating, intermittent or convergent. In many of the cases he found that the condition disappeared.

The Final Results of Researches Upon the Influence of Voltaic Light Upon the Skin.

MAKLAKOFF, Moscow. (*Archives d'Ophthalmologie*, May, 1901.) Summing the matter, this author believes that the action of voltaic light upon the skin presents three distinct periods: 1. A period of contraction—narrowing of the vessels—this being of very brief duration. 2. A period of relaxation of the vessels—this being slow in appearance. Its duration depends upon the length of time of the exposure of the skin to the influence of the light. 3. A period following the relaxation of the vessels. It commences by the appearance of photoelectric phenomena and ends in the detachment of the epidermis of the epithelium of the conjunctiva and cornea. This period lasts five or six days.

The author believes that the influence of voltaic light may be utilized in the treatment of certain morbid conditions.

Paralysis of the Associated Movements of the Eyes.

POULARD, Paris. (*Archives d'Ophthalmologie*, May, 1901.) Poulard reports the case of a woman who experienced a severe attack of paralysis with loss of consciousness, lasting for six hours. Following this she "could not see anything in its right place."

Upon examination it was found that there was an insufficiency of the external rectus muscle of the right eye, with a weakening of elevation of the left eye, though this symptom could not be definitely asserted as being depend-

ent upon either the superior rectus or inferior oblique muscle. Moreover, there was inability to lower either eye more than ten degrees beneath the horizontal meridian.

He believes that a lesion of the nuclei along the floor of the fourth ventricle and the aqueduct of Sylvius can probably be excluded in his case by the fact that these nuclei are in such close proximity that it is difficult to conceive of one being affected and not the others. He considers that the most likely explanation of the condition is that of a lesion of the extranuclear centres which are probably located in the quadrigeminal tubercles.

After a careful study of the case, he sums his findings as follows: There exists besides the nuclei of origin of the oculo-motor nerves a series of coördinating centres (regulators of the associated movements of the ocular globes). These extranuclear centres are probably occupied in coördination of reflex binocular movements. There are also supranuclear centres, which seem to play a rôle in coördination. To these may be added a number of cerebellar centres whose action is that of maintaining the relations and assuring an equilibrium of the visual axes.

ABSTRACTS FROM SPANISH AND PORTUGUESE
LITERATURE.

BY

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(Quarter Ending June 30, 1901.)

Exenteration in Panophthalmitis.

LAPERSONNE, Lille, (*Archivos de Oftalmologia*, Vol. 1, No. 1, Jan., 1901) proposes a new method for exenteration in certain conditions of panophthalmitis, especially when the sclera has threatened to rupture. This method consists the use of an actual cautery, or where it can be obtained of the galvano-cautery, which can be used for making the incisions. The patient is first chloroformed and the cornea is then incised with the Graefe knife. This incision is enlarged with scissors above and below; but he doesn't excise any of the cornea, since his experience teaches him that the cautery in itself is so antiseptic that no infection takes place and union is very soon obtained afterward. When the pus has been evacuated and the lens extracted without touching the membranes, a large cautery at white heat is introduced within the ocular cavity, and is passed all around the circumference. A small cautery knife is insufficient—the large one in use in general surgery is by far the best, and this knife should be curved, its convexity corresponding about to that of the eyeball. When the cautery is withdrawn, it is usually covered with the contents of the eyeball, and purulent debris. It is then reintroduced at a white heat and the sclera thoroughly cleaned. The operation is concluded by washing out the globe with sublimate, not so much for the purpose of antiseptis, as for the special object of removing charred tissue left behind. No suture is necessary. The opening is covered with iodoform and dressed with a simple bandage. In this way not a drop of blood is lost.

All vascular tissue is charred and adheres to the cautery knife. The immediate effect of this procedure is an absolute cessation of all pain. It is marvelous to see how these patients, after recovering from the chloroform, express their gratitude at the relief from the terrible agony which was suffered before the operation, a great contrast to the usual method of operation in which the pain remains for sometime afterward. The secretion continues for three or four days and it is therefore necessary to renew the bandage about twice a day. The swelling of the lips of the wound diminishes rapidly and after ten or more days the cicatrix is complete. The stump is regular but small, and the remains of the cornea can still be detected, but there is no pain in the stump and the artificial eye can soon be inserted, the movements of which, in his experience, are much more natural than after the ordinary operation. He illustrates his method by one case of a young man in the best of health who had never suffered from his eyes, but who was injured in the right eye by a piece of metal from his gun. The pain soon became violent. The globe ruptured and some blood was seen. A short time after the accident, the metal escaped from the wound in the lid. The patient was examined twenty-four hours after the injury. The eyeball was found swollen, it protruded and its movements were restricted. There was no doubt that the case was developing into panophthalmitis, and an immediate operation was decided on, especially since the body temperature was above normal. The excision with the cautery was carried out. On recovering from this, the patient, who before had been in agony, was quite relieved, and his temperature sank to normal. The subsequent course was simple; although there was a little pus for a short time, no other signs were visible, and on the twenty-fifth day the wound was so thoroughly healed, that he could bear the artificial eye. The culture tube showed that there had been staphylococcus affection. The author is convinced of the rationality of his method.

Iridectomy In Cataract Extraction.

SANTOS FERNANDEZ, Havana, (*Archivos de Oftalmologia*, Jan., 1901) discusses iridectomy in the operation for cataract, and states that from the viewpoint of infection iri-

dectomy is no longer necessary, while most surgeons claim that the simple operation is the best; Fernandez, after reasonable experience, cannot feel convinced that the after effects are always so satisfying as they are when iridectomy is made. Much depends, of course, upon the location of the incision, and prolapse can always be avoided, if the incision is far enough within the cornea, but this interferes unfortunately with vision. There are otherwise apt to remain adhesions which destroy the symmetry of the pupil. He illustrates with three cases from his practice where the immediate result was very good, but in which adhesions or prolapse formed later, inclining him to wish that he had resorted to immediate iridectomy.

Chancre of Bulbar Conjunctiva.

SANZ BLANCA, Madrid, (*Archivos de Oftalmologia*, Jan., 1901,) reports a case of chancre of the bulbar conjunctiva, which he wishes to add to the thirteen he has been able hitherto to discover in the literature. A woman of 22 years presented herself with the following signs: the conjunctiva of the right eye was swollen and on the temporal side was seen an area of two or three mm. in the center of which was an ulcer, passing insensibly into the periphery. It was of a dirty yellow color with some deposit over it, and felt rather hard, but was not painful when touched. The eye was otherwise normal, there was no vesicular injections, nor any disturbance of vision. The patient complained only of some roughness on shutting the lid. The preauricular glands were swollen. This had begun ten or twelve days ago, and gradually increased to its present condition. She could give no cause for the trouble, except that her husband had had some sores in the mouth. Both the husband and wife were watched and when secondary manifestations presented themselves, specific treatment was then begun immediately, and the case ended as he expected.

Keratitis Vesicularis.

OBARRIO, Ecuador, (*Aroles de Oftalmologia*, April, 1901) reports a case of a child five years old who had been ill for two months. At first it seemed to be a case of bilateral leucoma due to a purulent conjunctivitis, but the mother denied all such history. On the contrary she said he had had a fever two months ago

during which he did not open his eyes but that there was no secretion about them and that when he did open them, however, she noticed a white bleb which broke after a few days without causing any pain. The child during its illness had had pustular eruptions on various parts of his head and on the day on which he was first seen there was still some signs of them on various parts of his scalp, each cornea showed an opacity of exactly the same size and shape as that in the other eye but of different degrees of density. In the right eye it was white while in the left it was translucent and opalescent. This opacity lay below the pupil. On close examination it was seen that the mother's story was true, for the opacity could not have been produced by a conjunctival inflammation. Evidently there had been a pustular eruption in the cornea, with loss of epithelium, disappearance of the pus and regeneration in all parts except where the scars showed. The first question was whether these leucomata were permanent or whether they would disappear with time. At the time of the eruption there was said to be also purulent otitis and there was still some secretion from the ear. There was no doubt that the corneal affection as well as that of the ear was directly connected with the eruption on the scalp. The author seemed to think it was some paludic inflammation although the patient lived in the mountains at an altitude 3000 meters above the sea in a temperate climate. Very little treatment was thought advisable since the vision was relatively good (20/40) and there was no inflammation. No bacteriological examination was made and the case has not been watched long enough to report on the ultimate results.

Optic Neuritis Following Scorpion Bite.

GONZALEZ, Leon, Mex., (*Anales de Oftalmologia*, March, 1901) in an elaborate article on the study of etiology of optics neuritis, mentions an interesting case with the above cause. A woman of 50 years of good health was bitten by a scorpion in the hand. Immediately afterward she felt drowsy, the skin itched, the tongue was so swollen that she could hardly speak. She sweat very much and drooled. There was some muscular twitching. All these symptoms disappeared within a few hours, but the patient noted with surprise that her vision was decidedly weak,

and that she was rapidly becoming blind; an ophthalmic examination was made the next day and nothing abnormal could be seen externally, but in the fundus was seen a serous suffusion around the disc which made it appear larger than natural. The vision was obliterated but there was no other sign. By the prompt use of diaphoretics and iodid of sodium absorption was so encouraged that within a week the exudate disappeared, vision returned and the fundus appeared quite normal.

Other cases have been reported on the bite of scorpion, especially by Herrera of Durango, where strabismus, miosis and moderate amaurosis appeared, but these were attributed to retinal congestion and paralysis of the accommodation. Whatever may be the physiological effect of the scorpion poison it certainly, in this case, affected the optic nerve and the retina itself.

Four Cases of Extraction of Pieces of Metal From Within the Eyeball by Means of the Electro-Magnet.

VELEZ, Mex., (*Anales de Oftalmologia*, March, 1901) reports these cases:

In the first case he used the electric magnet of Hirschberg. The foreign body lay within the anterior chamber and was easily extracted through the corneal incision with a preservation of normal vision.

In the second case the piece of iron had penetrated the conjunctiva and sclera but was not located. The wound was enlarged and the magnet introduced through it and without further difficulty the metal was withdrawn. A conjunctival suture was taken and a bandage applied. There was some reaction which ceased within three days and the eye looked healthy, although the fundus could not be seen. Twenty days afterward vision was $1/10$, the fundus visible, lightly clouded. Below and close to the periphery in the the vitreous was seen a mass of exudate.

Third. A mechanic had suffered an injury eight days before with various bits of iron, some of which a physician had extracted by means of forceps. At the time of examination the left eye was considerably swollen and inflamed, the cornea opaque and there was hypopion; between the caruncle and the cornea there was a horizontal wound cm. long. Through this the Hirschberg magnet was introduced and extracted a bit of metal. Infection had pro-

ceeded too far, however, so that the globe was finally enucleated.

Fourth. In this case the wound had been produced two hours before the examination. There was a slight vertical cut in the cornea 3 mm. long. The lens had been affected and some lens matter had already escaped. The magnet was introduced through the wound and withdrew a bit of metal. After it a great deal of lens escaped and the rest was extracted by an operation some days later. The eye healed without reaction leaving a vision 1/10.

These four cases, one of which was negative, one with perfect result and two others with a retention of moderate vision encouraged the author to have great confidence in the magnet method.

Glaucoma of Rare Origin.

DEHOGUES. (*Revista Ibero-Americana de Ciencias Medicas*, June, 1900.) A negro woman of 70 with complete cataract in left eye and partial cataract in the right, general arterial sclerosis, senile atrophy of the optic nerve, was taking iodid of potassium and arsenate of strychnin. Ten days after beginning the drug she presented herself with acute glaucoma in the left eye and sympathetic symptoms in the right. Eserin was at once prescribed and relieved the attack to some extent. The woman died shortly after. In examining the literature he finds that the use of strichnin is said sometimes to produce acute glaucoma. If this is so the vascular theory of glaucoma must be retained.

Early Ophthalmia in an Infant.

CHANCON (*Revista Medica*, Nov. 15, 1900) had an opportunity of observing a very early case of ophthalmia. The child was born in the early morning and at daybreak the mother noticed the swelling of the eye-lids and some pus around the lids. In addition to this a bystander happened to receive a drop into his own eye and within 24 he showed the sign of infective conjunctivitis. This seems to dispute the theory of Wecker to the effect that the child passes through the vagina with the eyes closed and consequently must receive the gonococcus later on. Fuchs, however, claims to have seen new born infants with blennorrhagia and corneal ulcers. This case was cured with 33 per cent. of protargol.

Retinal Hemorrhage in Pernicious Anemia.

RAMOS (*Gaceta Medica de Mex.*, Nov. 15, 1900) reports a case of pernicious anemia with profound melancholy and retinal hemorrhages. The left eye had suffered severely with the visual acuity reduced to 1/3. In the field of vision there was a very large scotoma of at least 15 degrees on either side. There was also discromatopsia and metamorphopsia. Besides the usual treatment for anemia, he prescribed ergot in large doses and found that he had stopped the hemorrhage taking place within the eyeball and was able to retain vision .8. The case recovered finally and is interesting as a proof of the possibility of stopping hemorrhages within the eyeball when they occur in anemia.

Hygiene of Vision in Schools.

TRONCOSO (*Anales de Oftalmologia*, Jan., 1901) has interested himself in the study of hygiene at schools, following the path of Cohn, Erisman, Javal and others. He seems to have studied the literature very thoroughly of English and American investigations and refers to a work of Ramos in Mexico of the same character. They have a difficulty in Mexico which we are to some extent overcoming here, that is, the prejudice against the use of glasses. If that can once be overcome he thinks that Mexican children might be saved a great deal of trouble in after years. In addition, the hygienic surroundings are not such as they ought to be. He finds a very good proportion of children having visual defects, such as corneal opacities, injuries to the lens, etc., and he suggests the separation of children with normal vision from those who have some defect apart from mere refractory error.

Unusual Complications of Cataract.

DEL TORO. (*Anales Medicos Gaditanos*, 15 Sept., 1900.) The author has devoted a great deal of study to that condition in senile cataract where the iris has peripheral adhesions to the lens, and thinks that it is not always recognized as it should be. Of course the original cause is an iritis which may have been overlooked, although this inflammation undoubtedly has a bad influence upon the nutrition of the lens and the condition is not as good, therefore, for operation. If, however, it is decided to operate, the early use of a mydriatic will show the condition and

perhaps lead to the evidence of difficulties during the operation. He prefers to use in such a case Critchett's knife, for he thinks that with this he avoids the danger of lacerating the ciliary process, and in some cases he resorts to the operation of Galezowski—large iridectomy, introduction of discision needle and, to destroy any adhesions, passage of the needle between the iris and the lens.

Surgical Treatment of Ectropion by Terson's Operation.

ALONSO, San Luis Potosi, Mexico, (*Anales de Oftalmologia*, December, 1900) who seems to have an unusually good opportunity to treat such cases, declares that he has now operated seven times with the best results by the method of Terson of Paris, which he thinks is most suited to preserve the integrity of the lacrimal apparatus.

Protargol in Ophthalmia Neonatorum.

NICOLAS GUEROLA, in an inaugural thesis presented to the National School of Medicine in Mexico (*Anales de Oftalmologia*, November, 1900) gives a systematic report of the results obtained by him in treating the condition with protargol, and in all cases the clinical diagnosis was confirmed and verified by a bacterial examination, both before and after treatment. In many of these cases one eye was treated with the nitrate of silver, 2-1/2 per cent. with protargol 50 per cent. The results would show in favor of the use of protargol for in almost all cases where the two eyes were differently treated that with the protargol recovered quicker than the one treated with the silver. Where protargol was used for both eyes recovery varied from 10 to 15 days. In one case protargol 20 per cent. was used and recovery was reported in 13 days. Between the local applications of silver salt, an eye wash of boric acid was used.

He refers to the same advantages which others have found in using protargol, i. e., its painlessness, even in 50 per cent. solution, as compared with the nitrate of silver, the fact that the protargol forms no precipitate such as does the nitrate and therefore leaves the eyes clearer; its harmlessness when the cornea is affected. He has also used protargol in the prophylactic method of Credé (10 to 15 per cent., and has not been disappointed in it.

A New Screen for Ophthalmic Examinations

DR. OBARRIO, Guayaquil, Ecuador. (*Anales de Oftal-*

molgia, October, 1900.). In order to avoid the heat coming from the ordinary lamp used when an ophthalmic examination is made, especially where the physician is practicing in the tropics and all heat possible should be avoided, Obarrio has devised a simple little screen which he thinks is superior to others hitherto placed upon the market. He has used a device by which a vessel or chamber of water is interposed between the light and the patient or himself. This, of course, absorbs much of the heat and also some of the light and it is upon this system that he has based his own device. A metal standard supports a glass receptacle measuring 25 x 30 x 30 cm. into which water can be poured. Rolling over this something in the manner of a window shade is a screen which can be raised or lowered at will so as to obtain as much or as little light as desired. This water screen is not very thick and allows the light to pass it with hardly any perceptible loss. It is easily moved and can be as easily refilled with fresh cold water. If focal illumination is to be used it can be placed in front of the patient. If an ophthalmic examination is to be used it can be placed at his side on the table. He claims these advantages for it: First, it is not necessary to change the position of the lamp at all for the screen can be easily interposed in any position. Second, for direct examination the screen shuts off the heat as well as the light. Third, in the indirect or oblique examination the heat is shut off while the light is retained.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

Quarter ending June 30, 1901.

Congenital Bilateral Fistula of Lacrimal Sac.

DR. MERLIN (*Wiener Medicinische Wochenschrift*, April 13, 1901.) The writer, before reporting his own case, gives the history of the condition and he cites various authors who have described similar cases. The condition appears to be rather rare and comparatively few cases are reported. The writer describes a rather interesting case reported by Vossius of a 17 year old girl, where examination disclosed an elongated oval opening 5 mm. long and 1 mm. wide in the inner angle of the lower right lid just over the marginal border of the nasal process of the superior maxilla. From this opening there flows a clear tear-like fluid. The margin of this fistulous opening was smooth and surrounded by a pinkish mucous membrane like tissue. Neither the margin of this fistula nor the surrounding area was thickened or tender on pressure. The bone was apparently normal. The skin was thin and rolled easily under the finger. The largest Weber sound could be easily passed into this opening. Such a sound when passed directly backward into this fistula could be felt passing over the nasal process of superior maxilla for about 5 mm. and then to enter an irregular cyst like cavity with smooth walls—the tear sac. This cavity could be followed up into a narrow recess like continuation going into the upper lid. In a downward direction the sound could be passed behind the nasal process in the direction of the lacrimal canal for a distance of about $\frac{3}{4}$ inch. This canal ended blindly—at any rate it did not communicate with the nose.

The upper part of this canal was wide enough to contain two medium sized Weber sounds and below it contracted gradually so that even the smallest Anel probe could not be passed through the lower end of the canal into the nose.

This disturbed communication with the nose could also be demonstrated when he injected a weakly colored solution of Kali permanganate into the fistulous opening. The fluid regurgitated but did not enter the nose.

The writer then reverts to his own case which he describes as follows:

Infantrist Franz T. was referred to him on November 28, 1900, for examination of the eyesight. He was apparently healthy. Left eye had myopia of—10 D; right eye was also myopic—1.5 D. Vision on the right side was normal, and after applying the suitable glass to the left eye, Vision—6/10. Ophthalmoscope revealed in the background of the left eye a small papilla and contracted arteries. Shortly after birth his mother had noticed a fistula in the inner angle of the left eye and the patient declares that cigarette smoke would often come out through that opening.

Examination showed that just at the point of entrance of the lacrimal canal a small opening could be seen in diameter about 2 mm. The skin surrounding this opening is smooth, soft and elastic and contains no thickening. The largest Weber sound could be passed easily through this opening in a downward direction into this nasal duct.

A solution of permanganate when injected into the left eye came out immediately through the left nostril. And even smoke when inhaled and the nostrils occluded, would come out through this opening. The puncta lacrimalis is prominent and the tear canal is patent. Lacrimation is absent. The condition does not annoy the patient in the least and he refuses to allow any operation for closure of this fistula.

The right eye also shows just above and below the caruncle a very small, capillary fistula, whose margin is similar to the one on the left eye. Capillary sounds can be passed into the lacrimal sac and lacrimal canal. The puncta lacrimalis is prominent and the tear canal is patent. There is no escape of tears from this eye.

Tenotomy of the Interior Rectus Muscle of the Left Eye in a Case of Congenital Paralysis of Superior Oblique of Right Eye.

DR. ELSCHNIG. (*Wiener Med. Wochenschrift*, March 30, 1901.) It is largely owing to Alfred Graefe that more precise rules have been formulated for the amelioration of the results of paralysis in cases where the elevator or depressor muscles of the eyeball have been permanently paralyzed. Whereas in paralysis of the lateral muscles of the eye we have two methods of correcting the difficulty—the substitutive measure of advancement of the paralyzed muscle, or the compensative measure of tenotomy of the opposing muscle of the same eye. Yet the compensating measure is alone applicable in case of paralysis of the elevators or depressors. This measure consists in tenotomy of the corresponding muscle of the healthy eye and in this way equalizing the paralysis of both eyes.

The action of the elevator and depressor muscles is, however, so complicated and so combined that none of them possess a direct antagonistic in the same eye, nor a directly associated muscle in the other eye. Nevertheless it is possible, as has been proven by Graefe in a number of cases, to attain good results by means of the compensatory measure of tenotomy upon the unaffected eye, so that the annoyance of double vision will be either entirely done away with or at any rate greatly improved.

Very few such cases have been described in literature and the operation has been but seldom attempted.

The author then reports a case of paralysis of the superior oblique where tenotomy of the inferior rectus was performed together with partial tenotomy of one of the lateral muscles of the eye.

The patient, a male 23 years old, has been troubled since infancy with double vision whenever he looked to the left or directly in front. The right field of vision was normal. In the last few years he had also noticed that when reading, his eyes became tired very soon unless he held the book toward the right side. Vision is almost normal, the right eye requiring a weak, concave cylindrical lens. Paralysis of the right superior oblique is present. Fixation is performed by both eyes when the patient looks to the right, but as soon as he looks directly in front the right.

eye alone takes part in fixation while the left eye becomes displaced downward and to the left, and this displacement becomes more marked when the patient looks more to the left. As is often the case the paralyzed eye performed the fixation whereas the healthy left eye deviated secondarily.

Typical double vision is present except in patient's right field of vision. Owing to the paralysis of the right superior oblique which rotates the eye downward, the right eye was tilted relatively too high and the left eye relatively too low. Now in order to do away with the double vision or rather to increase the field of single vision it was necessary to weaken that muscle of the left eye which rotates the eye downward in the left field of vision, i. e., the rectus inferior muscle.

Tenotomy of the left inferior rectus muscle produced the desired result, but immediately after the tenotomy divergence of the left eye became apparent which although present to some extent even before the operation, still had been increased by the tenotomy of the inferior rectus which possesses powers of adduction of the eye. By fixation in the median line the left eye turned outward beneath the covering hand; but with both eyes open binocular fixation was possible. He therefore enlarged the opening of the conjunctiva in an outward direction and then, controlling the position of the eyes, he gradually cut through the lower part of the external rectus tendon. The large opening in the conjunctiva was then closed by a few silk sutures. As soon as the operated eye could be uncovered, it was seen that the field of binocular single vision had been greatly enlarged. Only in the lower field of vision did double vision exist. In the middle line, however, as was proven by examination with the stereoscope, binocular single vision was present. The patient was able to work and was very much gratified with the result of the operation.

Neuropathic Forms of Blepharospasm.

FEJER, DR. JULIUS. (*Ungarische Medicinische Press*, June 20, 1901.) There are two kinds of blepharospasm, the symptomatic and the essential. The cause of the symptomatic blepharospasm is always a malady, the cure of which removes the blepharospasm. In the essential

form the lids and the bulb of the eye are always healthy. This form of spasm is produced by a reflex or organic cause. The spasms are of klonic or tonic character, the latter being especially very painful to the patient, as the spasm lasts for several minutes and the patient can lose his sight temporarily in most needed situations.

The author now describes two cases of blepharospasm caused by functional or nervous disorders. A young well nourished boy winked very frequently, and close observation on the part of the patient showed that the frequency of winking increased. With -1.50 D. his vision was normal, with the ophthalmoscope hypermetropia of $+1.50$ D. was found. The musculus ciliaris was in a state of constant spasmodic contraction and the lens was flattened. The false myopia could be easily explained as due to these causes. He forbade the patient to work, and by instillation of atropin for a month he paralyzed the muscle, and by this the spasm was released. Besides this, he ordered the patient the use of cold water baths and outdoor life; in a few months the patient was cured. The second case differs from the first one in the fact that beside spasm in the orbicularis and ciliary muscles there were spasms in the facial and shoulder muscles, i. e., chorea. All these symptoms disappeared after the cure of the original sickness. In nervous children the previous symptoms can be associated with symptoms of asthenopia nervosa, as the frontal and orbicular muscles, which are supplied by the upper branch of the facial, are in a constant state of tonic contraction.

In this second category belong the cases which are caused by hysteria or epilepsy. The author cites two cases.

A 16-year old peasant boy was taken into the hospital, as he constantly contracted his eyelids forcibly. The mother complained that her son is unfit for any work on account of his poor sight. The boy states that he has a poor sight for distance as well as for near since his birth. He attended school, but only with great difficulty did he learn to write and read. For the last three years he winks constantly, the light hurts him in a peculiar manner. In fixation of an object he sees blue points in the air, and in the sun he must use dark glasses, otherwise he feels a sensation of vertigo and fainting.

The boy is normally built, he never suffered from any serious disease, his appetite and digestion good.

Examination shows that the lids and bulb of the eye are normal. The vision right is 5/10. With + 2.0 D. his vision improves to 5/7. On the left eye his vision is 5/15. With + 1.0 D. it becomes 5/10. With the ophthalmoscope there is to be found a total hypermetropia of only + 1.0 D. The interior of the eye is perfectly normal. The examination of the spasmodic condition meets with considerable difficulties. On the left side the region of the supra and infraorbital nerve is painful on pressure and the spasms increase on pressure in this region. During his stay in the hospital there developed spasms which extended over his entire face and lasted for a few minutes. The patient, however, never lost consciousness; he only lay tired and motionless in his bed and complained of severe headache. The author used a galvanic current for the lids and prescribed sodium of bromate internally. The condition improved somewhat, the spasms became less frequent and were of a milder type. After that the patient left the hospital and was lost sight of.

2. The author noticed a similar condition in a merchant 38 years old. Vision on the right eye was 5/7, on the left 5/10. The fundus of the eye was normal. The patient complained of constant winking and photopsia. The examination with the ophthalmoscope was very difficult. Occasionally he suffered from epileptic attacks. The spasms extended over the face and extremities, but he never lost consciousness. The patellar reflex was exaggerated. He ordered the patient the use of a galvanic current and cold baths, but the patient is still suffering from his blepharospasm.

Both of the above mentioned patients went to the oculist, as the affection of the eye caused them the greatest annoyance. In both cases the blepharospasm was caused by hysteria, as the spasms in the face came in the form of attacks and the patient never lost his consciousness. The author did not try suggestive treatment in his case, but the traitement moral had the effect that the patient winked more rarely and opened the eyes wider if he was quite severe and stern with him. It is quite an interesting fact that in both cases photopsia and vertigo set in as soon as

light entered suddenly into the eye. The author considers this characteristic of hysteric blepharospasm in contrast with those cases, where the photopsia appears in connection with spasms of the lids in the various affections of the conjunctiva and the bulbus of the eye.

The spasm of the lids is brought about by irritation of the facial branch of the facial nerve. The cause of the irritation lies in the centrum or in the periphery. According to Sanger and Wildbrand, this irritation may be either organic or functional in nature. The root of the facial nerve may be injured by tumors, hemorrhages, abscess; in other cases the spasms may be the direct result of irritation of the root of facial nerve.

Orbicular spasm as a direct result of irritation of the main facial trunk or its peripheral branches may be caused by tumors or aneurisms lying at the base of the brain.

Orbicular spasm which is purely functional in nature is met with in chorea, migraine, epilepsy and hysteria.

The cases reported in this article belong to the functional class.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas, City, Mo.)

Dr. Pichler has established himself at Prague, as privat docent.

Prof. A. Jacob, of the Royal Ophthalmic College, Dublin, is dead.

Docent Dr. Kruckmann has been appointed Professor Extraordinary, at Leipsic.

The death is announced of Dr. Julian Lopez Ocana, a distinguished Spanish oculist.

Dr. S. Louis Zeigler has been appointed surgeon at the Wills Eye Hospital, in place of Dr. George C. Harlan, resigned.

Dr. H. V. Würdemann has been appointed consulting Ophthalmic and Aural surgeon to the Milwaukee County Hospital.

Dr. Joseph C. Beck has been elected pathologist and professor of otology at the Chicago Eye, Ear, Nose and Throat College.

Dr. Tscherning has become director at the Physiologic-Optics Laboratory in Paris (the old University) succeeding von Javal.

Dr. George Stirling Ryerson, of Toronto, has been made a Knight of Grace of the order of St. John of Jerusalem, for his services in South Africa.

Dr. Charles A. Oliver, has been placed on a committee for promoting the general welfare of the University of Pennsylvania, by Provost Harrison.

The California Eye and Ear Hospital, San Francisco, established four years ago, has outgrown its present quarters, and will erect a new \$20,000 building. Dr. Tenison Deane is president, and Dr. Redmond W. Payne Secretary.

The Ophthalmological and Otological Society of Washington City at the thirty-seventh session elected the following officers for the ensuing year: President, S. O. Richey; vice president, W. H. Wilmer; secretary and treasurer, Anton Coe.

Dr. Samuel D. Risley has resigned, after a service of many years as professor of diseases of the eye at the Philadelphia Polyclinic. As a mark of appreciation of his services the Board of Trustees created the office of Emeritus Professor of Diseases of the Eye, to which Dr. Risley was elected.

Ophthalmological and Otological Society of Washington, D. C.—The thirty-sixth session of this Society was held on March 12, at

the office of Dr. Henry A. Polkinhorn, who presented the paper of the evening on "The Use of Suprarenal Capsule in Ophthalmic Practice."—Journal American Medical Association.

Dr. Frank W. Abbott, a well known oculist, died at Buffalo, New York, April 9, 1901. He had been ill for about three months. Dr. Abbott was a man of large clinical experience both in general work and in ophthalmology, and the poor as well as rich profited by it. He was devoted also to church work and very strong in his religious convictions.

Dr. Henry C. Haden, Clinical Assistant in the out-patient department for diseases of the eye, at Jefferson Medical College Hospital, Philadelphia, at the recent Tenth Semi-Annual meeting of the South Texas Medical Association read a paper before the section on Ophthalmology, entitled, Exophoria; Its Significance and Treatment.—The Philadelphia Medical Journal.

Glioma of the Retina.—A. Petterson, on the basis of a histological examination of the tissues removed in three cases of this new growth, concludes that the theory of Wintersteiner, that the tumor cells originate in the neuroepithelial layers of the retina, is unnecessary, since it seems possible for the new cells to develop from the glia cells normally found in the ganglion cell and nerve-fibre layers in the manner formerly accepted as true.—New York Med. Record.

Electric Light Least Injurious to the Eyes.—An English journal named *The People*, has the following item of news: "A Russian medical man has decided that the electric light is least injurious to the eyes. He says that the oftener the lids are closed the greater the fatigue and consequent injury. By experiments he finds that the lid would close with different illuminations per minute: Candle light, 6. 8; gas, 2.8; sun, 2. 2; electric light, 1.8.—Medical Record.

The Rockefeller Institute for Medical Research was incorporated on June 13th with the Secretary of State at Albany. The purpose of the corporation is stated to be "medical research with special reference to the prevention and treatment of disease." The directors are: William H. Welch, of Baltimore; Simon Flexner, of Philadelphia; Theobald Smith, of Boston; T. Mitchell Prudden, L. Emmett Holt, Hermann W. Biggs, and C. A. Herter, of New York City.—New York Medical Record.

Western Ophthalmologic and Oto-Laryngologic Association.—At the Sixth annual meeting of the Western Ophthalmologic and Oto-Laryngologic Association held in Cincinnati, Ohio, April 11th and 12th, the following officers were elected: Dr. C. R. Holmes, Cincinnati, Ohio, President; Dr. W. L. Dayton, Lincoln, Neb., first vice-president; Dr. J. O. Stillson, Indianapolis, Ind., second vice-president; Dr. H. W. Loeb, St. Louis, Mo., third vice president; Dr. O. J. Stein, 100 State Street, Chicago, Ill., treasurer; Dr. William L. Ballenger, 100 State street, Chicago, secretary. At the meeting in Cincinnati

the scientific program was of very high grade. Forty new members were elected.

The Vision of the Boers.—In view of the extraordinary powers of vision credited to the Boer soldiers by numerous war correspondents it is of interest to hear the opinion of an expert ophthalmologist on this subject. Mr. R. Brudenell Carter, who some 5 or 6 years ago conducted the examination of the vision of a large number of London school children, and who is an authority on visual standards, stated very recently at the Society of Arts that, from the application of his experience to the course of the war in South Africa, he believed the great majority of British soldiers, after a fortnight's exercise on the veldt, would see distant objects as quickly and distinctly as the native Boers, and their interpretations of appearances were quite as accurate. This opinion is endorsed by several British army surgeons who served in the Transvaal.—*American Medicine*.

A Surgeon May Perform an Additional Operation Without Consent of the Patient.—According to a recent decision by Judge Kavanaugh of Chicago, a surgeon may perform an additional operation without the consent of the patient if he discovers a condition which renders such action necessary to preserve life after a first operation. The decision was rendered in the case of Mrs. Agnes Muehern against the Post Graduate Medical School and Hospital. Mrs. Muehern was operated upon by one of the professors of the college, and while she was under the influence of an anesthetic a condition as indicated was discovered and a second operation was performed. When the woman regained her health she brought suit against the college.—*The Philadelphia Medical Journal*.

A movement has been set on foot by Drs. Samuel D. Risley, Alexander Randall and others, of Philadelphia, together with the corps of school medical inspectors, whereby it is hoped the Board of Education will adopt a plan to have examinations made of the eyes and ears of all pupils attending the public schools. To a certain extent this has already been done by the corps of volunteer medical inspectors, but the work has not been satisfactory, since a great amount of time is required to do this work thoroughly. It is hoped that school medical inspection will be put on a paying basis, and that the above work can be instituted, beginning with the fall term. Up to this time both branches of city council have entirely ignored the work of the school medical inspectors.—*Ophthalmic Record*.

Training of the Blind.—Director Keller, of the Institute for the Blind, at Vienna, exhibited before the Physicians' Society, a 7-year-old boy, born blind, but with perfectly formed eyes, whom he taught in 14 months to discern colors, forms and objects; also to read. His method is first to put the child in a dark room, and by means of a movable disk of light teach him to distinguish light from darkness. Then objects are placed on the light disk and the child given their names; colored glass placed before a lamp teaches him colors;

then geometric figures are shown on the disk, slowly leading to the formation of letters, and finally reading is taught. Next the disk is removed and objects shown in the dark room with the light rays full on them, and from this point the sight is gradually accustomed to the daylight.—American Medicine.

Exophthalmic Goiter.—At a recent meeting of the Society of Neurology, Dr. Babiniski described the results he had obtained in the treatment of exophthalmic goiter by salicylate of soda. In one case a woman, 28 years old, began to show symptoms of this affection nearly three years ago. Since January, 1899, the symptoms have increased considerably, and in February there was a clearly defined goiter, very apparent exophthalmia, termination in the arms, and the pulse was 140. The patient had grown much weaker and lost flesh. The treatment by salicylate of soda was recommended and continued several months. In October, 1899, the condition of the patient was absolutely transformed. The pulse was only 80, the goiter and tremulation had disappeared, the patient's strength had returned and she had increased in weight. Toward the end of last year all exophthalmia had disappeared. Dr. Babiniski also cited two other cases where noticeable improvement followed the use of salicylate of soda.—Journal Amer. Med. Association.

A Judge's Opinion on Osteopathy.—We fail to see of what use it is to pass a law for the regulation of the practice of medicine and surgery when any country judge can deliberately misinterpret the act so as to render it inoperative. Recently, in Venango County Pennsylvania, the judge in the Common Pleas Court rendered an extraordinary decision in a case involving the legal status of osteopathy; and the grounds upon which his decision was based were as fair a sample of judicial sophistry of word-splitting as it has been our lot to see. Judge Criswell declared that the "practice of medicine," as defined by the act of Legislature, means the treatment of disease by the use merely of drugs, and that any other kind of treatment is not the "practice of medicine." Therefore, as osteopathy does not treat disease by the use of drugs, it is not a practice of medicine within the meaning of the law, and its practitioners can have full swing in the State of Pennsylvania without a license and without let or hindrance.

It is difficult to characterize such judicial wisdom as this. The respect which we owe the bench is severely tested by the utterance of such Dogberry opinions. According to Judge Criswell, a physician is simply a drug dispenser. What a surgeon is, in his opinion, we do not pretend to know. To keep within the meaning of the law, the doctor must prescribe pellets. If he attempts to practice in the broad field of preventive medicine, of hygiene, of dietetics, of hydrotherapy, of climatology, of suggestive therapeutics, of psychiatry, of obstetrics, of ophthalmology, and of three-fourths of the whole field of surgery (i. e., so far as he practises in these fields without drugs) he is no doctor. Ergo, any ignorant charlatan can enter these fields, and, so long as he gives no drugs, he is not

required to have a license under the laws of Pennsylvania! Fortunately, it is sufficient merely to present Judge Criswell's opinion in order to show its foolishness. We trust the Supreme Court will reverse his decision and save the commonwealth from such stultification.—The Philadelphia Medical Journal.

Some Phases of the Cancer Question, by Dr. Roswell Park.—Cancer always begins as a local manifestation. Both antemortem and postmortem studies are necessary to determine the course of the disease. Park has held for 15 years that cancer is an infectious disease. The specific cause is believed to be due to a protozoon which is exceedingly polymorphic. All observers have seen the same cells but have called them by different names. He thinks, however, that many organisms may enter into the causation of cancer. The subject must be studied from a biologic and chemic standpoint. This the speaker and his colleagues are attempting to do at the University of Buffalo. The small hyaline bodies which are believed to be the specific cause of cancer have been found plentifully in abdominal ascites of animals suffering from visceral cancer, and in all cancer scrapings. They are lighter than fluid and hence are seen near the glass slide in hang-drop. The speaker said that Dr. Gaylord could state positively that all sarcomas and carcinomas contain parasites, and that these parasites are not the fungus growths observed by the Italians. He would not say, however, that the fungus growths never produce cancer. The great difficulty arises when attempts are made to cultivate the organisms believed to produce cancer. This must be done in living animals and not in media. In this connection the nature of the vaccine virus has thrown some light on the subject. The experiments of Coplin and Funke with vaccine virus were referred to with approval. The author said fluid containing the supposed germ of cancer was injected into 14 guinea pigs, all of which died; the average length of life after injection was 50 days, whereas fluid injected into fresh guinea pigs from those already inoculated caused death on the average in 25 days, showing that the virulence increases with inoculation. Animals dead of cancer have the germs in the peripheral blood. In 1 case of Hodgkin's disease the germs were found in the peripheral blood 7 days before death. There appear to be 2 forms of the injection: (a) that which attacks the lymph-nodes, and (b) that which attacks the spleen. The organisms may remain in the lymph-nodes, after the latter are removed and dried, and may then be used for injection into animals. Spontaneous retrocession of cancer may occur, and this is not inconsistent with the germ theory. In a later discussion Park said that all animals that had been artificially inoculated had died. A full report would later be made of all their work.—Proceedings of Am. Surgical Association, in American Medicine.

The Treatment of some Apparently Incurable Eye Affections.—The mainstay of the successful physician must ever be Hope. It is true that recovery will take place spontaneously from many morbid

conditions, but in the vast majority of instances this will be favored by, if it does not actually require, the intervention and guidance of the intelligent therapist. The remedies employed need not necessarily be drugs; in fact, the greatest good is often brought about by means of physical or physiological agencies. We may not always be able to explain the mode of action by which the good is affected, but meanwhile well substantiated empirical observation and practice are not to be despised. Of the force of the foregoing remarks illustrations will be found in a clinical lecture delivered a short time ago by Dr. Charles Bell Taylor (*Lancet*, April 27, 1901), in which are related a number of remarkable instances in which sight was restored to persons who were believed to be incurably blind. This was accomplished in part by means of electricity, mercury in large doses, alone or in combination with other drugs, derivatives, together with such operative measures as seemed indicated by the needs of the individual case. Thus, electrolysis will be found most useful in the treatment of angiomas, inoperable tumors, adenoids, granular lids, and other abnormal growths. As a cauterant, a cataphoric agent, an illuminant of internal cavities, a destroyer of bacilli, a generator of heat and ozone, electricity is unrivalled, and the electro-magnet both as a sideroscope and an extractive agent is indispensable in the treatment of accidents of frequent occurrence. The galvanic and faradic currents are most valuable in the presence of corneal ulcers and opacities, of neuro-paralytic keratitis, of paralysis of ocular, facial, and other muscles. Dr. Taylor claims further that the electric current has a potent influence upon all living protoplasm, a restorative power for which there is no substitute, not only in cases of neuritis and degeneration the result of injury, with the accompaniment of palsied muscles, but also in the presence of neuritis and degenerative changes such as accompany and follow upon attacks of influenza, diphtheria, diabetes, typhus, typhoid, rheumatism, and other febrile disorders. As a stimulant, tonic, and catalytic agent under such circumstances he believes it to be of the greatest value, and a last resort in the treatment of atrophy of the optic disc, neurasthenia, asthenopia, failing brain power, and general nervous declension such as is observed at the menopause in women, or as a result of advancing years or exhausting disease, or the abuse of alcohol or tobacco, or lead poisoning.

Mercury may be administered in the form of blue pill, ointment, vapor, or subconjunctival injections. For the last purpose the cyanide is to be preferred, the injection being made painless by the addition of a small amount of eucaine. It is frequently necessary to combine morphin with the pill, and pilocarpin is an important adjuvant. The latter may be given internally in doses of gr. $\frac{1}{2}$ or hypodermically in doses of from gr. $\frac{1}{10}$ to gr. $\frac{1}{4}$. Elaterin also is a useful aid in doses of from gr. $\frac{1}{40}$ to gr. $\frac{1}{10}$, especially in the presence of detachment of the retina.

Concerning blood-letting the advice is given to bleed early and to let the blood flow until the pain, if there is any, has quite gone.

When the eye alone is affected, natural or artificial leeches may be applied to the temple with great advantage. Among other useful derivatives are sinapisms, blisters, setons, issues, icebags, hot-water bags, Turkish baths, lamp-baths with hot pediluvia, intestinal derivatives, hot and cold aspersion, and the actual or electric cautery for purposes of stimulation, counter-irritation or destruction of tissue.—New York Med. Record.

The "Refracting Optician."—"Every man can instance many examples where harm has been done by the pseudo-profession of opticians. A case, reported elsewhere, recently occurred in this city. A mother, at the instance of a teacher, took her son, a lad of 8 or 10, to one of these fakirs with the history of dullness in school and poor vision. Unable to improve the visual acuity of the boy by any glass, he jumped at the conclusion that there was some cerebral trouble, and, telling the mother that there was inflammation of the optic nerve, advised her, not as one would suppose, to see a physician, but instead, to give the boy some strychnia. She obtained from a druggist some tablets containing $\frac{1}{50}$ of a grain of strychnia and proceeded to feed the boy upon them, thinking that the prescriber was a doctor and that he would not advise her to do anything that was harmful to the boy. As a result convulsions occurred and a dangerous termination was only averted by a timely knowledge of the treatment he was undergoing. The vision was easily improved by proper lenses and no further trouble was experienced. A lad with a vision of $\frac{1}{50}$ was wearing concave spherical glasses of 12 diopters, with no improvement of vision while his refraction was hypermetropic and required for correction a convex glass of 9 diopters, a difference of 21 diopters. A man recently came to the Rhode Island Hospital with a diagnosis of 'inflammation of the optic neuritis,' another with a detached retina for an operation for cataract; a lady recently had her glasses changed 4 times in as many months, with a steady impairment of vision, who was suffering from albuminuric retinitis and who died within a few weeks after the diagnosis was made and the condition ascertained; and so example after example might be quoted where injury to the patient resulted both by incorrect adaptation of lenses and failure to recognize existing morbid processes. This is not, however, a plea for special legislation, but an appeal to the profession of this State to discourage the practice of consulting incompetent men for ocular defects. There is no selfish or pecuniary consideration to this question: on the contrary every one of the dozens of incompetent men who are doing this work are manufacturing future patients for the physician, but the welfare of the community demands that the profession take a decided stand on this question. They have it in their power to control this evil within at least moderate bounds."—The Providence Medical Journal, April, 1901.

Some Optic Ideas of the Old Greeks—It must always be interesting for the man of modern optics to listen to the first stammering

of that science which in its complete development has given us the microscope, the telescope, the ophthalmoscope and the ophthalmometer. As the first purely optic writings we may regard those of the great geometrician, Euclid, who lived about 300 B. C. at Alexandria in Egypt. He thought that from the human eye there emanated visual rays which alone allowed us to perceive external objects. He knew already about the difference of central and peripheral sight, for he says: "No visible object is seen all at once. There remain gaps upon which no visual rays are falling. We believe, however, to see the whole at once, because the visual rays are moved to the side very rapidly." He also called attention to the fact that of a whole page only a few letters can be seen simultaneously. He knew already the main facts about the reflection of light, but he was unable to determine the position of the focus of a concave mirror. Euclid does not treat of the refraction of light, although the fact was known to the old Greeks, as is evident from a spurious passage in Euclid's book on catoptrics, which reads: "When an object is put into a vessel and placed just beyond sight it will be seen again from the same distance as soon as the vessel is filled with water." The old Greeks also know the burning glass, for it is mentioned by Aristophanes about 400 B. C.; but they had no idea that this effect of burning depended upon the refraction of light.

This latter subject we find first treated by Ptolemaeus, who lived about 150 A. D., at Alexandria. This celebrated astronomer, whose ideas about the movement of the earth and heavenly bodies have been accepted for almost 1500 years, up to Copernicus, also believed that the act of vision took place by means of visual rays emanating from the eye and falling upon the different points of the object; although he also mentions rays that go out from a luminous body. He first measured the angle of refraction for each angle of incidence and obtained pretty accurate results.

In spite, however, of these accurate observations, Ptolemaeus could not find the law which binds together the angle of incidence with that of refraction. This law was derived much later (in 1620) by Snellius. Ptolemaeus was also unable to give a general and correct solution of the problem of images formed by spheric mirrors. But there can be no doubt that Ptolemaeus made the greatest advances in the science of optics. Almost a thousand years had to pass until the Arabs began to take it up again and until they succeeded in improving upon the teachings of the great Alexandrian thinker.—The Keystone.

THE ASSOCIATION OF AMERICAN MEDICAL EDITORS—The annual meeting of the editors' association was held at St. Paul, June 3-5, 1901, the sessions being convened in the library hall of the Ramsey County Medical Society. This was the most successful meeting held for fifteen years, both from point of attendance and the high standing of excellence of the papers presented. Of especial moment was the paper presented by Dr. Burnside Foster, of St. Paul, entitled "Some Thoughts on the Ethics of Medical Journalism,"

which was discussed by Doctors Lancaster, Gould, Love and others. At the instance of Dr. Foster, a committee consisting of Doctors Simmons, editor of the Journal of the A. M. A., Gould of American Medicine, and Foster of The St. Paul Medical Journal, was appointed to amend the constitution and by-laws of the association by adding certain rules concerning the nature of the advertising which is to be admitted to the pages of the journals in affiliation with the association. These rules are to be binding on all members, the committee also being advised to suggest such revision of the constitution and by-laws as may be deemed advisable.

Among other papers read were those of Dr. John Punton, entitled "The Relative Value of Medical Advertising;" that of Dr. Dudley S. Reynolds, entitled "Improvements in Medical Education;" Dr. Harold N. Moyer, "Relation of the Medical Editor to Original Articles."

The association adopted resolutions favoring the establishment of a psycho-physiological laboratory in the Department of the Interior at Washington, D. C. It also appointed a committee to draft a resolution requesting the Board of Directors of the Louisiana Purchase Exposition Co., in charge of the St. Louis World's Fair to recognize and commemorate in a suitable manner the great work done in medicine and surgery. The American Medical Journalist was selected as the official Journal for publication of papers and proceedings.

The annual dinner of the association was held at the Metropolitan Hotel on the evening of June 3d, President Stone acting as toast-master. The speakers of the evening were Doctors Love, Stone, Moyer, Matthews, Marcy, Fassett, Hall. They confined their remarks to subjects of interest to medical editors, and contributed not a little toward the scientific features of the meeting.

At the session of June 5, the officers for the ensuing year were elected as follows: President, Dr. Alex. J. Stone, of St. Paul; vice-president, Dr. Burnside Foster of St. Paul; secretary and treasurer, Dr. O. F. Ball of St. Louis.

The executive committee appointed for the ensuing year, consisted of Doctors Gould, Matthews, Lillie, Fassett, Marcy.

The next meeting will be held at Saratoga Springs, N. Y., in June, 1902.

The Protozoon of Cancer.—Harvey R. Gaylord publishes in the American Journal of the Medical Sciences, May, 1901, a report of his cancer studying during the past three years in the New York State Pathological Laboratory. He describes some incubation and inoculation experiments previously referred to in a communication made to the Medical Society of the State of New York in 1899. In a case of adeno-carcinoma of the peritoneum the greater portion of the tumor had undergone mucoid degeneration and the peritoneal cavity was filled with a clear, straw-colored fluid. This fluid, removed with every aseptic precaution, was found to contain a large number of small hyaline bodies, which were observed under the microscope to increase in size and change their form and pass through a cycle of

development to what appeared to be a spore-forming stage. This fluid was injected into three animals—two, a dog and a guinea-pig, in the peritoneal cavity; one, a guinea-pig, in the jugular vein. The guinea-pig and dog which were inoculated in the peritoneal cavity developed no tumor, but a marked peritonitis and enlargement of the regional lymph nodes. The abdominal cavity of each animal contained a small amount of fluid; and in this fluid could be detected the characteristic spherical bodies, nucleated bodies, and sacs filled with granules present in the primary case. In slides taken from this fluid and incubated for a period of three or four days in the thermostat it was possible to trace the development of larger structures from the small hyaline forms. Of particular interest was a portion of a slide so treated in which were found numbers of the organisms which had sent out pseudopodia toward a neighboring air-bell. In the animal injected in the jugular vein, killed after fifty days, the lungs were found to contain minute white nodules, which were beginning foci of adeno-carcinoma. The pulmonary blood-vessels showed marked proliferation of the epithelial and adventitial cells. The spleen of the animal contained a large amount of blood-pigment, and the Malpighian corpuscles were enlarged. The cells of the tumor and those of the enlarged follicles in the spleen were each found to contain within the nucleus irregularly shaped, deeply stained bodies of unusual appearance. About the periphery of the follicles and scattered through the splenic pulp were a number of round and oval bodies, which corresponded morphologically to what are known as Russell's fuchsin bodies. In the perivascular lymph spaces of the lung there has since been detected, by means of Plimmer's staining method, the presence of the half-grown organisms in large numbers, which correspond to those described by him as of constant occurrence in carcinoma in man.

Early attempts to cultivate these organisms were negative in their results, but in later experiments Gaylord has succeeded in cultivating the organisms, directly from cancer, from fluids which were in contact with cancer, and from experimental animals. The culture medium which he has found to be most satisfactory is fucus crispus bouillon, recommended by Celli for the cultivation of amoebae. The micro-organisms found in the peritoneal fluid were pale, spherical bodies from 2 μ to 10 μ in size. They were homogeneous, of pale, yellowish-green color, and at first were mistaken for fat droplets, although on closer examination their refractive index was seen to be too low. They were likewise resistant to ether, and when treated with osmic acid they failed to give the black reaction which characterizes fat. Attempts to stain them were partly successful. A few of the bodies contained granular material, which showed marked Brownian movement. The tubes were examined from day to day, and it was seen that the bodies slowly increased in size, became more indefinite, and gradually lost their yellowish-green color. As they increased in size they apparently became more fluid and commonly sent out pseudopods and long projections. Fine colorless

granules appeared in the protoplasm, and in some a delicate nucleus could be made out. Ultimately the larger forms of the organism became transformed into what appeared to be large sacs containing highly refractive granules and small spherical bodies, not unlike the free spherical bodies above described. The membrane of the sac was demonstrable as a pale, colorless structure. The diameter of these sacs was on the average of about 20 to 25, micro-m.m. or that of a good-sized epithelial cell. The author determined to his satisfaction that the yeast organism was not the essential cause of carcinoma and sarcoma and could not be confused with the organism already observed by him in fresh scrapings of carcinoma and in his experimental animals, and convinced himself of the identity of the organisms found in the fresh state and the forms known as Russell's bodies, Plimmer's bodies, and protozoon forms in the tissues. The organism is a protozoon belonging in the same group with the vaccine organism described by Funk in the British Medical Journal for February 23, 1901. It was found abundantly in all the organs, including the blood, in all cases of cancer examined, and in all cases in which cachexia was well marked the organism, especially in its younger forms, could be found in the peripheral blood

BOOK NOTICES.

Transactions of the Twenty-Eighth Meeting of the Ophthalmological Society, Heidelberg, 1900.

Edited by E. Von Hippel, A. Wagenmann, W. Hess and Th. Leber.
242 pages with 17 plates and 8 figures in the text. Wiesbaden, J. F. Bergmann, 1901. Price 8 M. (\$2.00).

This handsomely gotten up book with beautiful plates will be welcomed by every ophthalmologist. It contains the following subjects:

H. Wintersteiner (Vienna): On traumatic cysts of the iris, observed in 15 specimens, corroborating the theory of Buhl and Rothmund which attributes their origin to the implantation of epithelium into the interior of the globe.

Grunert (Tübingen) reports on 15 glaucoma patients treated by resection of the sympathetic nerve. The results so far obtained may be called favorable, but the number and time elapsed after operation are too short to allow of a conclusive judgment.

Uthoff: Infectious optic neuritis has no typical aspect. Excepting influenza and syphilis, it is extremely rare in the course of infectious diseases, much rarer than toxic affections of the optic nerve.

A. Birch-Hirschfeld (Leipzig) found in his experiments on the rabbit and chicken as to the pathogenesis of amblyopia from methyl alcohol the primary action of the poison in the ganglia and granules of the retina with subsequent partial degeneration of the optic nerve.

Schmidt-Rimpler: On dislocations of the lens.

E. von Hippel (Heidelberg): Anatomical description of two cases of congenital Korectopia with dislocation of the lens.

K. Wessely (Heidelberg): On the action of suprarenin on the eye. W. found in his experiments that suprarenin influences either the dilatator directly or the peripheral ganglia, not the sympathetic nerve itself.

E. Fuchs (Vienna): Detachment of the choroid after cataract extraction occurs not very rarely, is generally transient and is caused by aqueous entering under the choroid in consequence of ruptures of the attachment of the ciliary body.

F. Schieck (Halle): Two cases of exudative plastic choroiditis, illustrated on five lithographic plates.

H. Sattler (Leipzig): On the open wound treatment after operations on the eyeball, especially cataract extractions. It yielded excellent results in 240 extractions and numerous other operations on the eyeball.

St. Berheimer (Innsbruck): On the situation of the center of the sphincter. B. succeeded in destroying the small-celled medial nucleus in monkeys and, by the ensuing typical aspect of one

sided reflex and consensual immobility of the pupil, he proved directly his assertion, gained from former experimental and anatomical researches, that the small-called medial nucleus of each side is the center of the homolateral sphincter.

A. Bielschowsky (Leipzig): On the so-called paralysis of divergence. Peculiar disturbances of mobility of the eyes, characterized by lacking parallelism of the visual lines, so that diplopia for distance occurs, whereas within a nearer range binocular fixation is possible and caused by cerebral lesions, are best explained by the assumption of paralysis of divergence.

L. Heine (Breslau): On binocular vision.

F. Best (Giessen): On the limits of vision.

Fuchs (Vienna): On the visibility of the canal of Schlemm in the living eye.

E. Hummelsheim (Bonn): Central vision and peripheral illuminations.

A. V. Reuss (Vienna): On exhaustion of the visual field. A new method is described to ascertain this condition.

E. Hertel (Jena): Changes of the retinal vessels in arterio-sclerosis. H. found that the angiosclerotic changes are due to proliferation of tissue, especially elastic, elements in the media and adventitia from chronic inflammations, produced by alcohol lead, gout, etc. A further proliferation in the intima may obliterate the lumen. Such changes may be present before any visual disturbance occurs.

M. Mayweg (Hagen): On intraocular disinfection, advocates the introduction of iodoform pencils into the anterior chamber in infections of the interior.

Th. Azenfeld (Rostock): Histology of the lacrimal gland, especially the occurrence of fat within the epithelium.

A. Wagenmann (Jena): On double perforations of the ocular tunics by pieces of iron, observed in three cases. Demonstrations of patients, specimens and instruments.

C. ZIMMERMANN.

Relation of General and Organic Diseases to Changes and Affections of the Visual Organ.

A. Groenouw and W. Uhthoff, Profs. at Breslau. Graefe-Saemisch, *Handbuch der gesamten Augenheilkunde*, 2nd edition newly written, with numerous colored plates and illustrations, chapter XXII Vol. XI, part I., by A. Groenouw, Nos. 26 and 27, Leipzig, 1901, Wm. Engelmann. 4M. \$1.00.

After several months intermission in the appearance of the installments of the great handbook we take pleasure in heartily recommending this first part of chapter XXII by Groenouw. It commences with the relation of the diseases of the respiratory organs to the visual organ, considering the reflex relation between the eye and normal and pathological respiration, the propagation of diseases from one organ to the other, disorders of the eye from venous congestion due to impediments in pulmonary circulation, and metastatic affections. Section 2 deals with the dependence of the visual organ on circulation, the arterial, capillary and venous pulse of the retina, ocular symptoms in cardiac diseases with a synopsis of the

various kinds, embolism and thrombosis of the central retinal artery with 2 plates, diseases of the blood-vessels of the eye and brain, especially arterio-sclerosis, aneurysma, pulsating exophthalmus, thrombosis of the central retinal vein, with 2 ophthalmoscopic pictures, thrombosis of the cerebral sinus, varicosities of the orbital veins causing intermittent exophthalmus. Then follows the relation of the digestive tract to the eye. Affections of the teeth may cause limitations of accommodation, whereas otherwise the influence of the former is rather doubtful. Symmetrical diseases of the lacrimal and salivary glands, paralysis of ocular muscles after pharyngeal and tonsillar affections, the influence of parasites, retinal hemorrhages and hemeralopia in diseases of the liver, and the disorders of the eye in abdominal plethora, as first described by Foerster. Under the relations of the uropoetic system to the visual organ retinitis albuminurica and its various forms, as in the pregnant, occupy the largest space and are excellently described (with 2 colored ophthalmoscopic pictures), and the recent works on statistics as to the prognosis. etc., duly considered. Uremic amaurosis, edema of the eyelids, subconjunctival hemorrhages, primary inflammations of the uveal tract, cataract, glaucoma, hemeralopia, retrobulbar neuritis, impairment of accommodation, paralysis and spasms of ocular nerves in albuminuria, and secondary diseases of the urinary tract after primary ocular affections are thoroughly discussed, according to the importance of the subjects. In a handbook of this character not only the typical clinical pictures, but also the rarer forms must be mentioned for reference. All this we find in G.'s work in great perfection with an exhaustive bibliography. C. ZIMMERMANN.

Atlas of Topographic Anatomy.

Zuckerkaudl. E. Prof., Vienna, Part III: Abdomen, in 95 colored wood cuts with explanatory text, 122 pages. Wien and Leipzig, Wilhelm Braumüller, 1901. 8 Mk. \$2.00.

We hardly need to further recommend this beautiful, complete and very cheap atlas, the first and second parts of which we reviewed in the July and January numbers of the *ANNALS*. The third part presents the topography of the anterior abdominal wall, stomach, duodenum, liver, gall-bladder, pancreas, spleen, kidneys, retroperitoneal space and posterior abdominal wall. 12 plates alone are devoted to the topography of the caecum and appendix vermiformis, showing, in excellent execution, different aspects of this important region, with due consideration of varieties.

C. ZIMMERMANN.

Atlas of External Diseases of the Eye.

Haab, Prof., Zurich, second increased edition, with 80 pictures on 48 plates from water colors by Johann Fink, artist, and 7 illustrations in the text. Muenchen, J. F. Lehmann, 1901. 12 M. \$3.00.

The first edition of this beautiful atlas has been reviewed by Dr. Würdemann (Vol. VIII, 132, of the *ANNALS*) to which we beg refer the reader. That after 2 years a new enlarged edition appeared is another proof of the excellent merits of Haab's work. It has been increased by

10 illustrations reproduced from water colors painted by Prof. Adlemann and which belonged to the collection of the University Eye Clinic at Würzburg. These pictures are of especial value as they are executed with excellent technique and perfect medical understanding. The photos are preceded by a very good treatise of 72 pages on the method of examining eye patients. We strongly recommend the splendid work to every student and practitioner of ophthalmology.

C. ZIMMERMANN.

A System of Physiologic Therapeutics.

A practical exposition, of the methods, other than drug-giving, useful in the treatment of the sick. Edited by Solomon Solis Cohen, A. M., M. D., professor of medicine and therapeutics in the Philadelphia Polyclinic; lecturer on clinical medicine at Jefferson Medical College, etc. Published by P. Blakiston's Sons & Co., 1012 Walnut St., Philadelphia, Pa. Price, eleven volumes, \$22.00 net. Electrotherapy, by George W. Jacoby, M. D., consulting neurologist to the German Hospital. New York City; to the Infirmary for Women and Children, etc. In two books: Book I, Electrophysics-apparatus required for the Therapeutic and Diagnostic use of Electricity; book II, Diagnosis; Therapeutics. Illustrated.

This is perhaps one of the most ambitious works which an American publisher has had the pleasure of offering to the medical profession for some years. There are to be eleven volumes; the first two already published and presented to the *ANNALS* for review, deal with Electrotherapy in general; the third and fourth volumes treat of Climatology and Health Resorts, including Mineral Springs; the fifth, Prophylaxis, Personal Hygiene, Nursing and Care of the Sick; the sixth, Dietotherapy, of the Use of Food in Health and in Disease; the seventh, Mechanotherapy and Physical Education; the eighth, Rest-Mental Therapeutics; the ninth, Hydrotherapy, Thermotherapy, Phototherapy, Balneology; the tenth, Pneumatotherapy and Inhalation Methods; the eleventh, Serumtherapy, Vaccines, Toxins and Antitoxins-Organotherapy, Blood-letting, etc.—Principles of Therapeutics. Digest. Index.

The editorship of S. Solis Cohen guarantees thoroughness, while such names as Jacoby, Hinsdale, Ernst, N. S. Davis, Jr., J. K. Mitchell., F. X. Dercum, Winternitz and Tissier among others show to what various sources the publishers have gone for their authority.

These octavo volumes are offered with all the art of the modern printer; each is from 250 to 350 pages, printed on very thick paper with heavy separated type, good margin and black letters wherever it aids the student or the reader or can catch the eye for ready reference. The volumes as they appear will be noticed and criticised for readers of the *ANNALS* and this review must for the present confine itself to a study of the two which have already appeared:

Electrotherapy by Jacoby, of New York.

There are two volumes dealing with this subject. In the first is discussed Electrophysics and the apparatus required in Therapeutics and Diagnosis. There are 163 illustrations and six chapters

explanatory of the phenomena of electricity in general; the second part in five chapters concerns itself with the apparatus required for treatment and diagnosis (including the X-ray machine).

For anyone wishing to learn or to review the first principles of electricity, the simple mechanism of the battery, the work done by this manifestation of energy, no more pleasing or instructive book can be found. To be sure he intentionally uses the expression "current" again and again, even though physicists have agreed that electricity is not a flow, yet the word seems unavoidable, and probably for the sake of illustration nothing better can be found. The cuts are largely diagrams to clarify some point in the text, and as a rule are adequate, although there are some mistakes (what first edition is free from them?), as for instance No. 67 where the lettering is wrong, or on page 218 where figure 154 ought to be figure 156. What instruments are shown in cuts serve their purpose very well and are of modern scientific make. There is an error in calculation or in printing on page 94 where the equivalent of R is mistated.

The text, whenever the author is relying upon himself and his own experience, is admirable. I like such statements as (page 206). "It is my conviction that the outfits as today placed upon the market are mere toys. For efficient work a motor of less than one-quarter horse power is entirely out of the question. A good storage battery is better than any of the other appliances," and there are plenty of others running throughout the book, to show that he has his subject well in hand. The language is clear and the statements precise enough for anyone preparing himself for a mere practical knowledge of electricity. On the other hand, the student of physics, or he who prides himself on a mathematical mind, would find Jacoby somewhat sketchy and the plan of the book rather too popular—not quite encyclopedic enough; but it is not the author's purpose to prepare a text book for the laboratory, and therefore I think he has well accomplished his object in providing for the practical worker in the office or sick room a manual of all he needs to know or perhaps can know of the apparatus and power of electricity.

The second volume is of course that in which the therapist is most interested, for the work here passes from the theory of the current (sic) to the application of it in disease. In this there are five parts—Electrophysiology and pathology, Electrodiagnosis and prognosis, and Electrotherapeutics, this last containing special chapters on its use in diseases of the nerves, muscles, joints; of the eye, ear and throat, of the skin, in gynecology, and a sketch of the X-ray.

In this volume there are fewer illustrations (57) but more text, and the author has confined himself very closely to the subject. Those who have hitherto derived their information about the results of electricity from the older text books in which diseases are treated as entities and electricity advised either as a substitute for some other drug, or as a panacea for all ills, will, I am afraid, find many a disappointment in Jacoby. It is not exact to speak of him as a skeptic, for he gives precise information for the diagnostic and therapeutic use of the battery, yet he certainly must be classed as a

companion of Moebius in his attitude toward electricity as a therapeutic agent, and the old enthusiasm must give place in the reader's mind to a truer conception of what can or cannot be accomplished. So far is he a cynic about the claims formerly made, that he is willing to ascribe much of the effect to suggestion though still advocating its use. "Were it however absolutely certain—as it is not—that electricity cures only by psychic action and has no physical influence whatever upon disease, should we be warranted in giving up its use? Certainly not."

Jacoby himself is responsible for the 199 pages that treat of electricity in general medicine, and his task is well accomplished; there is omitted nothing essential to a comprehensive grasp of the subject, nor is there so much detail as to confuse the student with redundancy of way or method.

The so-called addenda has six subdivisions dealing with Electrolysis, Cataphoresis and X-ray; with Electricity in Surgery; in diseases of the Eye, Nose and Throat; in Gynecology; in diseases of the skin; there is here a noticeable unevenness, due to the style and predelection of the several authors contributing, and bad taste is shown in labeling so many of the cuts of instruments with the one author's name; it is a hard habit to overcome I am afraid.

Readers of the ANNALS will be most interested in Electricity in Diseases of the Eye by Jackson (Denver). It is plainly written without either too much skepticism or too much enthusiasm. Specific uses of electricity are clearly defined and concisely stated; its general uses are well indicated, while the physician is allowed his own judgment as to the benefit to be derived. The Hirschberg magnet is described and indications given for its employment. I should say that the Haab (Giant) magnet receives not quite enough mention, and the author is in error when he states that it is necessarily stationary; a good working portable instrument has recently been devised and put to practical service.

Such volumes as these and as the forthcoming ones promise to be, are great advance in medical literature; they remove the opprobrium of traditional empiricism from our profession, and practitioners will be better when guided by them.

A. B. HALE.

Self Examination for Medical Students; 3000 Questions on Medical Subjects, Arranged for Self Examination.

P. Blakiston's Son & Co., 1012 Walnut St., 1899, Philadelphia.

Third edition enlarged 1891. This pleasant little pocket summary of questions which the medical student, or even the practitioner can put to himself has already reached its third edition. This time it is enlarged by the addition of the questions asked last year by the State Boards of Health from candidates before the Practice Act. It embraces all the subjects taught at Medical and Dental Schools and certainly ought to be a great aid to any one who wishes to try to brush up his knowledge.

A. B. HALE.

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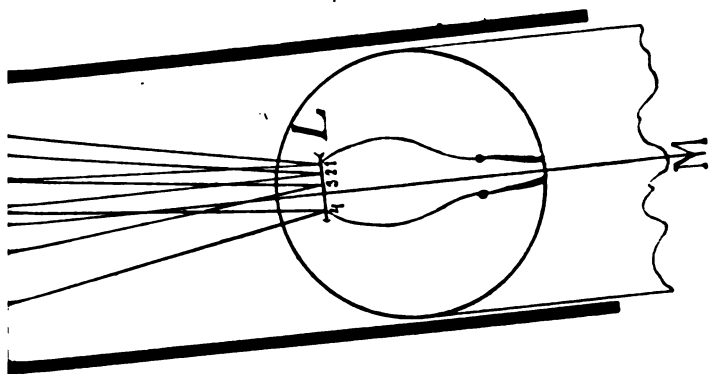


Fig. I.

PLATE I.

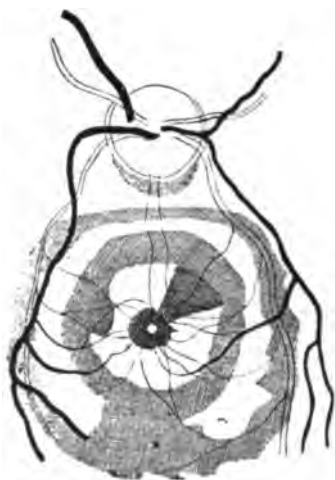


Fig. II.
Normal Macula Reflex.

THE ANNALS OF OPHTHALMOLOGY.

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No. 4.

OBSERVATIONS WITH THE NEW ELECTRIC OPHTHALMOSCOPE.*

BY DR. HUGO WOLFF,

BERLIN, GERMANY.

(Original Article from the "Zeitschrift für Augenheilkunde,"—v. Michel-Kuhnt—1901, No. II and IV.)

[Including plate and 4 figures in text]

I.

The use of electric light for direct illumination of the eye in various ophthalmic examinations has been suggested by *Albertotti* (1885),† *Dr. Thomas Reid* (1886),‡ and *Schweigger* (1889, 1891).§ The use of an electric incandescent lamp, a convex lens and an ophthalmoscope,

*See "Transactions of Berlin Medical Society," Feb. 14th, 1900, "Berlin Klinische Wochenschrift," No. 16—Paris Congress, August, 1900—Dörffel & Färber, compilers, Berlin, N. Friedrich Street, 105a.

†1885. *Albertotti*, Preliminari du studi sperimentali diretti a stabilire sopra nuovo principio l'esame funzionale dell' occhio. Gior. d.r. Accad di med. di Torino. 3. s. XXXIII p. 162.—Annual report for Ophthalmology, by Michel-Nagel, Vol. 16, p. 167.

‡1886. *Reid, Th.* Polarization Ophthalmoscope. Ophth. Review, p. 156.—Transactions of the Ophth. Soc. of the United Kingd., VII, p. 497.

§1889. *C. Schweigger*, The Electric Ophthalmoscope. Archives for Anatomy and Physiology (physiol. division) 3-4, p. 365.—1891. Objective Determination of Refraction and the Electric Ophthalmoscope. See Helmholtz, "Festschrift," p. 86.

strongly combined in various ways, was recommended by *Birnbacher* (1884),* *Dennet* (1885),† *Juler* (1886)‡ and *Schweigger* (*l.c.*). The combination of an ophthalmoscope with an electric skiascope was suggested by me;§ simultaneously the experiment of placing the source of light behind the *Recess disk*.

The observations made with the electric ophthalmoscope require a short explanation of the theoretical basis on which it is constructed. The drawing shows the latest improved construction of the instrument.

First, the *illuminating power* ("indicated clearness") of the light rays, which cut each other at the focus of the instrument (10 mm. in front of the central aperture) is correctly estimated according to the Rumford method. The necessary apparatus can be easily improvised by using a sheet of white paper and placing a pencil upright in front of it. The result given is minimal, but at the same time sufficient illuminating power of the instrument

$$(1 = \frac{r^2}{R^2}. R = 3 \text{ m.}, r = 0.30 \text{ m.}) \text{ corresponding to } \frac{1}{100}$$

of the illuminating power of a kerosene lamp burning low. In order to measure more exactly the conditions during ophthalmic observations, I constructed two artificial eyes (with pupil 6 mm. in diameter), by means of the Hartnack loupe (focus 2.5 cm.), corresponding very nearly to the natural proportions. Prof. Dr. Arthur König, in Berlin, had the kindness to test the luminosity produced on the retina with a Weber photometer and for this service I desire to express my sincere thanks. If the luminosity produced by a weak concave mirror (lamp 30 cm. distant from the latter), in the direct image, is taken as a unit,

*1884. *Birnbacher*. Incandescent light for ophthalmoscopic examinations in dorsal attitude. *Centralblatt für pract. Augenheilkd.* p. 188.

†1885. *W. P. Dennet*. The electric light ophthalmoscope. *Transactions of the Americ. Ophth. Soc.*, p. 149, 1886. *Electrical Ophthalmoscope*, *Transactions of the Americ. Ophth. Soc.*, p. 156.

‡1886. *H. E. Juler*. Ophthalmoscope with electric light. *Ophth. Review*, p. 56. *Recueil d'Ophth.*, p. 426.

§*H. Wolff*. The Electric Ophthalmo-Skiascope. Report of *Transactions of the German Ophthalmic Soc. in Heidelberg*, 1896, p. 326.

then the result of using the electric ophthalmoscope is: in inverted image = $\frac{1}{85}$, in direct image = $\frac{1}{10} - \frac{1}{4}$ of the illuminating power used up to the present time. As already mentioned (*l.c.*) the luminosity of the ophthalmoscopic image is proportionately the best, as only $\frac{1}{3}$ of the pupillary space is used for illumination and $\frac{2}{3}$ for sight. It is, of course, possible but entirely unnecessary (except in the case of very contracted pupils), to optionally increase the intensity of the light by means of the rheostat.

Concerning the cornea reflex, the drawing shows clearly that all cones of light rays striking on the lower half of the cornea in the eye (*O*) are reflected in such a direction that the reflected rays (perforated) are inclined downward and do not meet the eye of the observer. The Helmholtz eye, latest calculation* is taken as a standard with curvature radius of the cornea (*C*) = 7.8 mm. For the reason already given, the illuminating tube is inclined obliquely toward the front. The angle of inclination was found by construction, those incident rays being determined from the centre of curvature of the cornea, which invariably reflect downward. This was found to be the case with the upper light rays in horizontal position. The course of the light rays in the illuminating apparatus being given (see below), the axial inclination follows naturally, i. e., 5° to the perpendicular. To be sure it is necessary to correct the spherical and also the chromatic aberration of the illuminating lens; a common achromatic lens is sufficient. A minimal portion of light rays, reflecting irregularly from the sides, aberrating on the upper half of the cornea, which can be reflected into the eye of the observer, is caught by a diaphragm (*Bl*) attached on a level with the edge of the mirror. The refraction disk (*Rec.*) is placed so that it stands erect at the moment when the cornea reflex disappears. The drawing shows the proportions when the pupil (*PP*) is of average width, 6 mm.

The course of the light rays in the eye under examination was found in the simple way suggested by Helmholtz (*l.c.*). A parallel passing simultaneously through the nodal point (*K*) unrefracted, was drawn to every light ray (emmetropism supposed). In order to simplify the illustration only one principal plane, the posterior, and also the posterior

**Physiologische Optik*, p. 140.

nodal point are represented, an inaccuracy of little significance to the subject treated here. If the intersecting point of a light ray on the principal plane (H H) is connected with the intersecting point of a light ray on the retina running parallel directly through K, then the latter is the refracted ray. It will be found that if an approach to within 5 mm. is made, the image (L') of the incandescent light (L) is projected to the nodal point (K) and all rays of light coming to this focus diverge after crossing each other and pass directly to the retina. As a matter of course converging light rays fall on the retina also, but those very fine light cones (not illustrated) whose points lie in the retina and whose bases are in the light image, (L') diverge in all directions. *In other words a very large QUANTITY of light proportionately falls into the eye. (O) but the INTENSITY of light, with which a certain point on the retina is illuminated is very slight, as this quantity of light is dispersed over a large part of the surface of the retina.*

This field of illumination is spherical in form, as it represents the illuminated virtual image of the illuminating lens (D) and it corresponds in size to the latter, i. e., as proved by calculation, for a 6 mm. pupil ($z =$ ab. df 6.8, 6

$\frac{\text{of}}{\text{cf}} = \frac{6.8, 6}{8.6 + 15}$),* including the circle of dispersion

$= 7.5$ mm. in diameter. As the direct distance from the fovea centralis to the centre of the papilla optici, according to Landolt, amounts to 3.915 mm. so the whole region of the macula lutea and the optic nerve disk is illuminated and equally visible, with the exception of a very narrow space on the border, clearly seen at the intersection of the numbered cones of light rays. On account of the inclination of the illuminating tube, already mentioned, the field of illumination which would otherwise be pushed upward slightly by the refraction, due to the excentric entrance of light in the examined eye, is lowered sufficiently to permit the optic axis of the observer to pass through the centre, thus proving more agreeable to the eye sight.

What can be said about the *ophthalmic field of vision*? *Helmholtz* says (*l.c.*) when the pupil of the observer is on

*+ 5.4 [image of lens on the retina.]

a point with the anterior focus of the eye examined, then the visual lines emerging from the centre of the observer's pupil toward the edge of the examined pupil can be treated as light rays. As these rays after refraction in the examined eye run parallel to the retina, the field of vision is as large as the pupil of the examined eye. This is the case when the pupil of the observer is more contracted than that in the examined eye or when the examination is made with a quicksilvered, perforated mirror. The perforation, which is seldom more than 3 mm. in diameter, is generally smaller than the pupil of the examined eye.

But here there is no such diaphragm, and therefore the pupil of the observer's eye is active. In most cases, the pupil of the observer's eye is larger than that of the eye examined, because through practice the relaxing power of accommodation has become more perfect. This will be the case particularly when the pupil of the examined eye is very contracted. But here the field of vision depends solely on the pupil of the observer's eye. The illustration represents also a contracted pupil 3 mm. (P P). The rays (G G) emerging from the retina of the observer's eye (O¹) and crossing each other in the plane of the pupil, enter the pupil of the examined eye after refraction. In order to give a clear illustration, only the principal rays from the light cones emerging from the points mentioned (G G) are represented. The field of vision therefore between these two points *is considerably larger than the pupil of the examined eye*. It is also evident that the *largest portion* of this field of vision is illuminated. Continuing therefore to compare the eye to a loupe, the pupil in the observer's eye represents the *diaphragm in the field of vision* and the pupil of the examined eye simply the *diaphragm in the aperture*. In other words the latter is only capable of confining the transverse section of light ray cones and thus rendering the *ophthalmoscopic image dimmer*. *The field of vision as well as the field of illumination, as observation teaches, are only slightly influenced by very contracted pupils*. The diminished intensity of light can be easily regulated by the rheostat.

If the pupil is only the size of a pin head, then it is advisable to draw the incandescent lamp out of the illuminating tube slightly and thus transfer the focus to the central ap-

erture of the refraction disk, in other words to examine *without* a focus. The rays of light, which intersect in the incandescent light image, diverge toward the pupil of the examined eye, so that the larger part of the latter is illuminated and the action of diaphragm equalized. This arrangement is also very advantageous in *examinations of the periphery of the fundus*.

It can occur in cases of *extreme myopism*, that on approaching the eye under examination, no light emerges from the latter. This happens when the focus of the instrument is in the far point of vision of the examined eye, i.e., the latter is accommodated to the source of light. *It is only necessary to approach still nearer to the examined eye and the pupil will become radiant and the fundus present an appearance of inexpressible beauty.* The reason is to be found in the fact that the field of illumination in myopic eyes is much larger than in emmetropic eyes.

Concerning the *opacity of the refracting media*, it may be remarked, that in advanced cases of *opacity of the lens*, the tessellated appearance generally presented on the ophthalmoscopic image, disappears completely from the field of vision. This is due to the possibility of approaching very near. It is very comprehensible that opacities of all sorts in the *vitreous* are much more easily discovered if the direct image is extensively illuminated.

On account of the increase in size of the illuminated field of vision, *stereoscopic vision* is facilitated considerably, as the parallaxic displacement of objects seen simultaneously in a large field of vision, which takes place at the slightest involuntary movement, becomes distinctly visible. Here optical adjustment to the parts lying farthest back is required, whereas accommodation to all near points of vision takes place naturally.

Physiological opacity of the retina is recognized by an extremely fine gray cloud extending over the whole fundus. This cloudy appearance is most distinct near the papilla and *around the macula lutea*, coinciding with our anatomical knowledge of the thickness of the retina.

The *light reflex of the retina* is generally weak, so that often the central streak is hardly visible on the blood vessels. These therefore retain their natural reddish or blueish red color.

Pulsation is frequently visible in the arteries and veins of the retina. This appears at first like a rhythmic dilatation and contraction of the calibre, secondly like an expansion and contraction or complete disappearance of the central streak in the reflex. The closest observation is required to see this, whereas, it is easy, thirdly to see the pulsating lateral displacement, giving impression of elongation of the tubes. *This pulsation is clearly observed, fourthly, in the streaked retina reflex, which accompanies the blood vessels.* These streaks can be made visible by adjusting the instrument or by simply increasing the intensity of light. *These phenomena are perceived when the action of the heart is brisk and they can be rendered more distinct by inciting the action of the heart in the person examined by walking.* It appears that the pulsating dilatation of veins in the retina coincides with the arterial pulsation of the retina. *The venous pulsation in the RETINA is accompanied by dilation of the papillary ends, inside the physiological excavation, i.e., AFTER turning.* The direct transmission of the arterial pulsation to the veins, which experinece has shown to be very probable, is thus ophthalmoscopically proved. (see Türk, Arch. f. Ophth. XLVIII, 3). In all attempts to explain the physiological pulsation in the veins, a primary compression of the papillary ends of the veins has been taken as a starting-point. It is not my intention to attempt to decide this important question in so short a space of time. I will simply mention a fact as yet unknown, which furnishes evidence that this "compression" of the ends of the veins can be an optical illusion, demanding attention when the question arises in the future. In the physiological excavation the blood vessels are seen in the prospective, i.e., because the walls are perfectly transparent, a transverse section of the column of blood is visible. In the veins this column is oval. It is evident that the pulsating dilatation in the blood vessels is noticeable considerably more on the short diameter of this oval, which lies directly before us, in the physiological excavation than on the lateral diameter which the retina presents to view. For this reason it must be possible to see this venous pulsation more distinctly on the papilla than on the retina. It can happen that the transverse section of a vein, owing to its course on the wall of the

excavation, is partially hidden by the edge of the latter. In this case the vein appears to contract rhythmically from its normal volume. Particularly in the case of a nasal vein, the edge of the excavation can hide it so completely that only the pulsating dilatation of the former extends above it and becomes in this manner rhythmically visible. It then appears as if the vein compressed perfectly rhythmically. If this were the case and the explanation were correct, that the venous pulsation is the result of compression at its turning point, then the venous pulsation in the retina (the "impulse backward") would be simultaneous with the paleness ("compression") of the ends in the physiological excavation. One can become convinced that the contrary is the case by comparing the venous pulsation in the retina with that in the papillary ends. All these phenomena are frequently visible without other evidence of a pathological condition and we must consider them in the future, particularly *the arterial pulsation, as attributes of a normal fundus oculi.*

The reflex of the macula lutea represents a brilliant spherical or oval ring. *Its diameter is as a rule considerable greater than that of the optic nerve disk, greater therefore than it has been formerly represented.* The reflex presents generally a second still larger concentric ring. If the instrument is moved to an anterior plane, the reflex assumes very varied forms. (see Plate.) Sometimes in one and the same eye, both concentric rings blend in one broad ring, then again it stretches irregularly into the dark spot on the macula lutea and sometimes it forms a three-cornered V or sector-shaped reflection, with its point in the fovea centralis. At times the temporal portion of the reflex is wanting or it is very narrow, presenting the appearance of a sickle. An explanation of this phenomenon as well as of the first named can be found in the distention of the macula lutea and the raised surface resulting therefrom. This distention of the retina resulting from an increase in the cellular tissue of the ganglions, begins frequently not far from the edge of the papilla. This wall-like distention is often more apparent in the nasal half of the retina than in the temporal region. *Dimmer* in his work (1891, ophth. light reflex of the retina) was the first to prove that a reflex ring is produced on the concave

edge of the macula wall, which is nothing but the regular reflection of light rays, taking place constantly in that region. Ophthalmoscopic evidence of this lies in the fact that by properly turning the instrument, the reflection can be moved over the whole macula region, causing spots heretofore dark and dull, to radiate a brilliant light. The reflection described was formerly a characteristic of the inverted image and its appearance in the direct image is simply due to the fact that the light rays, on entering take a similar direction as in the inverted image. The focus of the illuminating lens (D) is brought by reflection to the plane of the pupil of the examined eye. The reflex is quite frequently to be seen, independent of the pigmentation, the construction of the examined eye and also of the time of life. It is often visible in individuals between 40 and 50 years of age.

Formerly the centre of the macula lutea, the fovea centralis, was frequently designated solely by its position, as uniformly represented in all well-known text books, i. e., "on this spot the bloodvessels of the retina seems to end in a point and one sees here absolutely nothing." The spot, if recognizable at all, was well-known as the red spot, with a small light reflex in the centre. It is generally spherical in form and its size is often greater than heretofore represented. It is often as large as the papilla. A comparison of this ophthalmoscopic image with the varying anatomical discoveries concerning the size of the fovea centralis will perhaps be the means of throwing much light on the subject in the future. The blood vessels approach close to the fovea centralis (see Plate). Having observed this red spot in every eye examined, as distinctly in youthful individuals as in those of advanced age, I feel justified in declaring that its existence is the general rule. The great clearness with which these shades of color are seen is due partly to the fact, that the light rays entering this large space are reflected in such a direction that they cannot emerge from the eye and are therefore not perceptible (Dimmer). For this reason the parts must appear in their natural colors. This is further more of interest in all cases where ophthalmoscopic proof is required of the existence of defects of vision near the fixed point. Such proof is only reliable when the position of the fovea centralis can be exactly given, as is possible here.

I would like to mention another observation and this is the frequent distinct appearance of a so-called *semi-atrophic, more or less sharply outlined sickle*, in emmetropic and hypermetropic eye. By intense illumination this is less distinct and therefore easily overlooked. I will confine myself to mentioning the fact observed and leave the explanation for further study.

Finally I am of the opinion that in the *majority of cases an examination in the inverted image can be omitted, as this offers no particular advantages as far as the size of the illuminated field of vision is concerned.* If such an examination is desired, then a suitable long focus must be constructed and the illumination increased by pushing the lamp into the illuminating tube; or the instrument is held in front of the examined eye, as in the direct image, and a convex lens placed in front of this, as I have already described formerly (*l.c.*). I have used this method frequently and can recommend it as excellent.

II.

THE FOCAL ILLUMINATION OF THE RETINA AND VITREOUS.

The focal illumination of the retina is produced with the electric ophthalmoscope by adjusting the glass in the refraction disk for the direct image, so that the spot on the retina under examination appears distinctly. The incandescent lamp is pushed into the illuminating tube far enough to allow the real image of the former, the focus, to fall on the spot in the retina examined, i. e., similar to my method of examining the pupil*.

The aim should be to illuminate the refracting media in front of the examined parts of the retina *as weakly as possible, the retina on the contrary very brightly.*

The method formerly used was directly the opposite. By using a concave mirror the illuminated image lies *in front* of the retina in the vitreous body. If the latter has defects, then the diffuse reflection inside is increased and the defects made distinctly visible. In other words the cloud which covers the fundus is made darker artificially. This solves the problem why an examination is difficult or im-

*Berl. Kl. Wochenschrift, 1900, No. 28 July 9th.

possible in cases where the inverted image is moderately clear, when slight defects in the refracting media exist.

If the focus, as described above, is brought into the plane of the retina, then all parts situated *in front of* the retina are *dimly* illuminated. The diffused opacity of the vitreous body creates little disturbance, as one can see through moderately thick opaque spots, formerly possible only in the inverted image. There is here the advantage of an enlargement of the direct image.

Opaque defects in the vitreous body can also be illuminated focally.

If there is opacity in the refracting media, this method is applied:

1. For illuminating spots on the retina (excavations of the optic nerve, foreign substances, etc.).
2. For examining the vitreous body itself.

In this case the focus is brought on the retina (after previous calculation of the refraction). Convex glasses (a weak sort if the eyes are myopic) are placed successively in front of the disk. All planes of the refracting media, from the retina to the cornea, can thus be observed simultaneously and illuminated focally.

This is an excellent method for easily distinguishing thin so-called "transparent" cloudy spots in the vitreous body directly in front of the retina. These thin cloudy spots which always cause impairment of vision, are no more transparent for the observer than they are for the afflicted eye.

If at times the opacity is in the anterior part of the eye, the clearness of the posterior refracting media can be excellently observed.

The conditions here represented are similar to those first determined by *Robert Koch* (1877,* 1878†) for *microscopic* examination. The case mentioned above is a spot in the vitreous body caused by serous exudations (emerging from the chorioid); this is of itself transparent, but becomes visible only through the diffraction of light produced on its surface. A preliminary condition for close observation in microscopic as well as ophthalmoscopic examina-

*Cohn's Beitr. z. biol. d. Pfl. vol. 2, p. 410.

†Untersuchungen über die Aetiolder Wundinfektionskrankheiten. Leipzig, p. 32 ff.

tion is that the *focus of illumination shall fall on the plane of the object*. Furthermore in the above mentioned method of examination, the base of the illuminating cone is screened in such a way that an acute angle is formed and the effect of the rays is almost the same as that of parallel rays. This alone renders the diffraction of light possible.

III.

PATHOLOGICAL CHANGES IN THE LIGHT REFLEX OF THE MACULA LUTEA; "CHORIOIDITIS, RETINITIS SEROSA CENTRALIS ACUTA."

My electric ophthalmoscope, which renders the light reflex of the macula lutea visible in the majority of persons under fifty years of age, *shows every change conspicuously at the first glance*, if the surface has suffered the slightest alteration (pathological swelling). These changes consist in a *peculiar tessellated appearance*, which the macula reflex assumes, whereby it loses the even, silky lustre which characterizes it normally (see Plate) and presents instead an *extremely dull appearance* (Fig. I, IV). At the same time the reflex loses in mobility, so that it is impossible to bring it beyond the limits of the macula as generally the case.

In one case the *gradual change in pathological process* could be distinctly followed. At first the light was somewhat dimmer than in the healthy eye. On the next day streaks of light began to appear, enclosing uneven meshes. These were at first very narrow (Fig. II) and the foveal reflex decidedly weak. In one or two days the meshy streaks of light became disintegrated, the irregular fields growing larger (Fig. III) and presenting thereby a still duller appearance. One had the impression of a swelling with hump-backed surface.

These phenomena occur so regularly and typically that it seems practicable to speak of them as numbered here. Reflex No. I and IV represent, as observation teaches, more or less rapidly passing transition states. Macula reflex No. III is seen most frequently and for the longest period of time. The swelling represented here has reached

its height; complete disappearance of the reflex was noticed only in one case of severe *general* retinitis.

Traces of these light phenomena, *without the slightest cloudiness in the retina*, can be frequently seen in persons, who complain of failing eye-sight, pain deep in the eyes, photobia, over-exertion, etc. Here the naturally silky, lustrous macula reflex appears streaked and meshy and *this is an objective symptom of hyperemia of the retina or chorioid*, which we are accustomed to suspect in all similar cases.

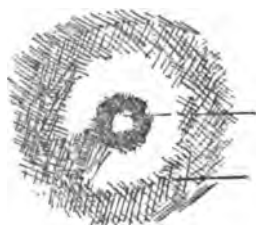


Fig. I.

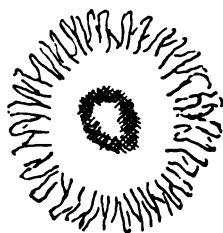


Fig. II.

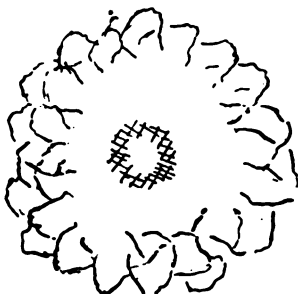


Fig. III.



Fig. IV.

Furthermore, the above mentioned changes are sometimes noticed when the fundus oculi is *crystal clear*, but the eye-sight has failed considerably ($\frac{5}{6}$ - $\frac{5}{15}$); the changes are in such cases the only objective symptom of *retinitis centralis*. Opacity or discoloration of the retina centre may appear later on, but it is not positive, as evident from the following cases:

A. S., 26 years old, electrician, photobia for 14 days, resulting from subjection to the dazzling light of an arc lamp.

27/9/1900. R. vis. $\frac{5}{6}$. L. vis. $\frac{5}{15}$. O: Emm., pathological macula reflex in both eyes, *fundus crystal clear*. Diagnose, retinitis centralis. Duration of ophthalmoscopic examination 2-3 seconds. No albumen or sugar in urine. Inunction treatment combined with perspiration, I. K., diet adapted to afflictions of the eye.

28/9/1900. R. vis. $\frac{5}{8}$. L. vis. $\frac{5}{20}$. O: In the right eye distinct pathological macula reflex, No. III. The fovea reflex is abnormally small, appearing like the head of a pin, but bright. *Fundus crystal clear*. In the left eye fovea reflex appears also like the head of a pin but dull in contrast to the right eye. Surrounding this is a small yellow halo, within the space occupied by the fovea. This is enclosed by a narrow dark-red wall, similar to the normal one, but bearing distinct radial streaks, somewhat diffused on the lower border, giving the impression of a circular hemorrhage. A narrow uneven space follows, enclosed finally by the macula reflex No. III. Papilla slightly clouded. Duration of ophthalmoscopic examination about 5 seconds; repeated three times, without artificial dilatation of the pupil.

29/9/1900. R. vis. $\frac{5}{10}$. L. vis. $\frac{5}{20}$. O: Right eye unchanged. In left eye fovea reflex has completely disappeared; otherwise unchanged.

2/10/1900. R. vis. $\frac{5}{6}$. L. vis. $\frac{5}{12}$. O: In the right eye, macula reflex is still tessellated, but nothing abnormal to be seen on the fovea. The fovea reflex has assumed average proportions, in diameter about equal to that of an artery branch. Left eye: In the middle of the fovea a blackish drop-like exudation, distinctly curved toward the point, has appeared in place of the reflex. This shines with a silvery lustre by focal illumination of the retina and shows distinctly parallaxic dislocation. Refraction at the top + 4 diopt. The *macula reflex* is almost normal, with silky lustre (see Plate), mobile, but showing fine radial streaks.

4/10/1900. R. vis. $\frac{5}{6}$. L. vis. $\frac{5}{12}$. O. 6-15-30 cm. O: Macula reflex in the right eye almost normal, but still bearing radial streaks. Left eye: macula reflex same as in right eye. The fovea presents a pale appearance, with some traces of the circular hemorrhage; the yellow halo still encloses it and the black point in the latter is still visible.—7/10/1900. R. vis. $\frac{5}{6}$. L. vis. $\frac{5}{12}$. O: unchanged.

16/10/1900. R. vis. $\frac{5}{8}$. L. vis. $\frac{5}{8}$. O: The macula reflex in both eyes has just attained the same silky lustre. Left fovea light pink with jagged edges, similar to the change which takes place in old age.

23/10/1900. L. vis. $\frac{5}{8}$. O: Fovea reflex restored, with parallactic mobility, same as in right eye; fovea still appears light pink in color.

Frequently, in fact regularly to all appearances, the above changes take place in iritis. I have observed them with surprising regularity in six successive cases of iritis plastica (1 I. rheumatica, 4 I. syphilitica, 1 I. traumatica). In four cases the vitreous body had become opaque when the examination was made and the changes were observed *a long time after it had attained its transparency*. In two other cases—and this seems especially important—the changes were observed *in the so-called preliminary stage of hyperemia of the iris*. In one case, while one eye was under treatment, the other became diseased (I. luetica). In another case, the patient had an attack of iritis three years ago, after recovering from inflammatory rheumatism; he presented himself for examination at the first signs of injection. I observed this patient very closely and will report the interesting facts in the case:

M. V., 31 years old, dismissed a few days ago from the hospital, after an attack of inflammatory rheumatism. 8/9/1900. Since yesterday injection of the right eye. Today vis. R. — 1 D. $\frac{5}{8}$, light pink pericorneal injection, which disappears in a few seconds after applying one drop of suprarenin. *Iris less mobile* than in the left eye. A few old synechia in the posterior portion, pigment aggregations on the anterior *capsula lentis* (I. rheumatica three years ago.) Fundus clear, light reflex of the macula lutea evidently weaker than in the left eye. Anti-rheumatic therapeutics, scopolamin, etc. 10/9/1900. R. — 1 D. $\frac{5}{8}$. L. — 1 D. $\frac{5}{8}$. The pericorneal injection disappears after one drop of suprarenin, applied only on the lower and inner edge of the cornea. The deeper ciliary injection appears on the outer and upper edge. Pupil medium width, with two arcades (old). *Appearance of fundus: There is no difference in clearness, when compared with the left eye, whereas the peculiar, tessellated appearance of the macula reflex is very conspicuous.* (Fig. II.) Fovea centralis dull red.

12/9. R. — 1 D $\frac{3}{5}$. Ciliary injection as above. Macula reflex retains the peculiar tessellated appearance; light meshes have become broader. (Fig. 3.) Fundus slightly clouded. *In a focal examination of the retina and vitreous body (1) with convex 3 diopt. a fine-grained, cloudy opaque spot in the vitreous body (about 1 mm. thick) directly in front of the retina.* With + 4 diopt. the dust-like grains become indistinct; with + 5 diopt., invisible. In the anterior portion, especially directly behind the lens, the vitreous body is perfectly clear. The lustre of the outer parts of the retina has diminished, whereas the retina in the left eye has retained its brightness. Tension not visibly changed, slightly minus if at all.

15/9. R. — 1 D. $\frac{5}{6}$. Becomes white in a few seconds, after an application of suprarenin. Fundus noticeably clearer. A few granular opaque spots visible with convex 2 diopt. Macula reflex still loosely tessellated, but the light streaks are broader (Fig. V).

18/9. R. — 1. D. $\frac{5}{5}$. Ciliary injection above and outside, disappears on applying suprarenin first on the outside and then above. Macula reflex unchanged, no opaque spots visible in the vitreous body.

The patient is able to return to business. Gradually and in conformity with all six cases observed (on an average in 2 or 3 weeks) the streaks of light became broader until all the intervening spaces were evenly filled with light. The light reflex regained its mobility and attained gradually its normal silky, silvery lustre.

As the macula reflex is nothing but a regular reflection of light (*Dimmer*) so the phenomena described here are results of changes in the surface of the macula lutea, which as a matter of course are produced by the slightest swelling. The peculiar tessellated appearance of the light reflex can be explained by the anatomical arrangement of the radial fibre cones, which, contrary to former opinions (*Schwalbe*, 1887) are more distinct in the limits of the macula lutea than in any other part of the retina. (*Dogiel*, 1893.) Probably the cuticular edges of the cone bases offer more resistance to serous infiltration and swelling than the soft contents. This easily explains the hump-backed surface already mentioned, also the tessellated appearance and immobility of the light reflex. The more

the central substance of the cone bases swells, the steeper the curves of the channels become, which lie between the humps formed, and which anastomose like a net and act as cylindrical reflectors. The light reflex therefore lies all the more directly in front of these channels and it is as impossible to bring the reflex out of these *bonds* as to remove the normal fovea reflex out of the fovea.

From a *clinical* point of view, these six successive observations certainly show that the deepest parts of the inner coats of the eye, in cases of iritis, become more frequently affected from the beginning of the disease, than we have been accustomed to believe.

Regarding the diagnosis, it is justifiable to speak of *hypermia of the inner coats of the eye*, if it treats of the ophthalmoscopic results described here without apparent disturbance of sight; also in the last stages of iritis and furthermore in asthenopia, over-exertion, etc.

If there is diminution in the eye-sight, an *inflammation* can be assumed, even if no opacity of the fundus is found. In this case one is led to believe that only a serous infiltration exists and one is justified, according to the accompanying symptoms, to call the disease *chorioiditis* or *retinitis serosa centralis acuta*.

In the first case reported here I would call the affliction of the right eye *retinitis serosa centralis* and the second case *chorioiditis serosa centralis rheumatica*.

The former case was up to the present time unknown to us. The latter has been generally termed a light attack of iritis, whereas it is solely a symptomatic irritation of the iris in *primary chorioiditis*.

It is true that doubt sometimes exists, especially in the beginning of the disease, if a diagnosis of retinitis or chorioiditis shall be made. *It is sufficient if the characteristic pathological changes in the reflex of the macula lutea present clearly a timely objective symptom of swelling and consequently a diseased condition.*

In the *prognosis* the above observations give an ophthalmoscopic explanation why, as experience teaches, in cases of iritis or retinitis, care and close observation are required for weeks after the vitreous humour has become clear and normal vision restored, in order to avoid a relapse. Not until the reflex of the macula lutea has returned to its normal condition and the surface of the retina regained its natural lustre, are we justified from a scientific, clinical point of view, in declaring the diseased eye restored to health.

THE PATHOGENETIC EVENTUATIONS OF CHALAZIAL TUMORS.

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The following are the deductions from the body of the essay, and are here given to indicate the scope of the work:

- I. Chalazia, from the nature of their structure and pathology, tend to degenerate.
- II. This degeneration may be suppurative, more or less acute, and result in:
 - a. obliterative inflammation, perforation, and spontaneous cure;
 - b. non-obliterative inflammation, perforation, and re-formation.
- III. Perforation of this type is usually external.
- IV. Chalazia more often break down by a very slow softening and erosive disintegration.
- V. During this disintegration the morbid secretions establish fistulous tracks for the purpose of drainage.
- VI. Chalazia may change in size, owing to the intermittency of drainage and the consequent damming up of the irritant discharges and the reactive inflammatory tumefaction.
- VII. The fistulous drains are of two kinds:
 - a. natural (by gland ducts);
 - b. artificial (by perforation).
- VIII. They show the same pathological conditions as sinuses and fistulae elsewhere, viz:
 - a. reactive softening of inner lining, and induration of the circumfistulous tissue, according to the degree and duration of the biochemical irritation of the morbid secretions;
 - b. lip-eversion and unhealthy granulations of their orifices.
- IX. A nipple-like orifice of a Meibomian gland denotes a fistulous duct carrying discharges from a chalazion

degenerating within the cartilage; this is mostly observed in the upper lid.

- X. Granulation masses around a conjunctival perforation are not everted chalazial tissue, but unhealthy granulations springing from the bordering edges of the conjunctiva from the constant bathing in irritant discharges.
- XI. An hordeolum internum, internal or hardened styte, is a nodular induration around a chalazial sinus. They are most frequent on the lower lid, because gravity, opposing evacuation, keeps the lumen constantly filled, whence the extensive induration.
- XII. Ordinarily an internal styte shows its true nature by a grayish vesicle upon its body, or a yellowish translucency from within, which often causes them to be incised for regular styte abscesses.
- XIII. The stagnating morbid secretions in fistulous ducts may soften the septal partitions and irruptions into healthy glands may take place until the whole cartilage is furrowed and honey-combed. This general infection I have described under the name of tarsadenitis Meibomica.
- XIV. Subcutaneous lid abscesses should be attributed to tarsadenitis, when the latter exists.
- XV. Smooth dark-colored polyps not springing from the internal canthal region are very apt to be the result of old chalazial drains.

A chalazion is a roundish tumor within the tarsal cartilage, varying in size from a millet-seed to a hazel-nut. It is not adherent to the skin, hence the latter moves freely over it. Under pressure it recedes from the finger, thus simulating free displacement upon the cartilage. However, this latter slipping on the part of the neoplasm is only *apparent* and really due to shifting of the cartilage. This can be verified by observing the free border of the latter, when this motion is thoroughly appreciated. Steadying the tarsus between the jaws of a Desmarres forceps (or any other) abolishes this ability of the tumor to slip away, another proof that the motion is due to the cartilage. These points are of value in differential diagnosis.

The age during which chalazia are most frequent is identical with that of scrofulous ailments and subjects

with tubercular tendencies are most likely to be affected. Eversion of the lid allows one to see the point of location by a spot of discoloration ranging from dark red to brown or ashen gray. Swanzy states that it is sometimes difficult to find the internal location, which is true, if the discoloration mentioned is absent, but even here (as in all other cases), size and outline are distinctly brought out, if one screws a Desmarres forceps upon the lid with the solid blade on the outside and directly over the tumor, while the fenestra is within (on the conjunctival surface). The growth then appears in the fenestral lumen as it does under the skin normally, which also is of importance as a matter of differential diagnosis.

Histologically, a chalazion is not a retention cyst, but a mass of granulation tissue, an accumulation of cells of the embryonic type, a granuloma, a mass of scantily vascularized "proud flesh."

Pathogenesis: The formative process finds its analogue in scrofulous swelling of the lymph-glands. Infection of the Meibomian glands occurs through a low-type-irritation fungus. This causes increased secretion and the accumulation of the products of fungus life activity, then soaking and swelling of the epithelium, followed by exfoliation. Reactive efforts on the part of nature to protect the denuded walls results in rapid cell building, but in the presence of excessive moisture and biochemical irritation, this shoots beyond the mark, producing, as always in such cases, granulation tissues of unhealthy type—caro luxurians—polypoid tissue. The chronic inflammation accompanying this process results in the distension of the acinary spaces and their conversion into a tumor sac. The recapitulation of these facts seemed to me necessary for an understanding of that which follows:

A chalazion may continue its growth in this manner for months and years, but its inherent qualities tend to a break-down sooner or later.

The two processes to which they are liable consist of:

- a. Suppuration (more or less acute);
- b. Gradual disintegration or softening.

A.—The first eventuality occurs chiefly in children and young persons. Acute suppuration results in softening and perforation of the cartilage, thus providing drainage

for the accumulated pus. Now, distension of a Meibomian gland would tell most seriously on the outer lamina of the cartilage, since the eyeball opposes bulging on the inner side. But tension and distension interfere so seriously with the nutrition of a part (checking blood and lymph currents), that it sooner falls victim to perforation. For this reason perforation usually occurs *subcutaneously* under a train of symptoms simulating the approach of a sty. The protecting influence of the bulbus serving as a quasi splint for the inner lamina of the cartilage is not merely shown by its exemption in suppurative distension, but also during the tumor-growth, which always causes displacement of the outer lamella, though the neoplasm arises from the center of the cartilage.

In the upper lid, the breaking of the subcutaneous pus accumulation through the skin occurs, as a rule, close to the free border of the lid, owing to gravitation. In the lower, this downward slipping (Senkung's abscess) is little opposed, hence gravitation may go on to such an extent that perforation (cutaneous) is so far below the tarsal cartilage and the chalazial fountain head, that the origin of the little abscess may not be recognized. If the suppurative process described is severe enough—and sometimes the whole lid may swell and even a core be expelled—it may become obliterative and lead to a spontaneous cure (first possibility).

However, such a spontaneous cure is actually rare, although *seemingly* frequent enough. In many cases the old capsule begins to re-accumulate neoplastic tissue, but for a while it may lie quiescent and then, too, the natural growth of a chalazion is so very gradual, that many months may elapse before the resurrected neoplasm is accidentally noticed. This tendency is fully realized by all clinicians. Prof. Rimpler says: "Häufig entsteht das chronische Chalazion nachdem ein acutes vorangegangen war."

B.—Gradual disintegration by softening is more frequent and almost becomes the rule after puberty.

Though they are granulomata, Virchow did well by choosing for chalazia the special term of "cystoplastomata," if for no other reason than the scarcity of their blood supply. This quasi-avascularity makes them much more sub-

ject to breaking down, especially in the presence of a low degree of irritation.

This breaking down starts at one point, whence it spreads by a process of erosion, as it were. A thick pul-taceous mass results which, by gradual cell infiltration, is converted into thick pus. This is the first to issue when the growth is incised. If not disturbed, thinning-down goes on very slowly, although the discharges do not liquify at any time sufficiently to become thoroughly fluid. However, the accumulation of waste products seeks drainage. (2nd possibility.)

The most natural outlet is through the duct of the gland. The forces affecting this drainage are:

- a. Pressure from orbicularis contraction;
- b. Lid motion;
- c. Gravity.

All these favor drainage from the upper lid, while in the lower gravity is an actual opposing force, and the other two are less effective.

It is for this reason that disintegrating chalazia produce such different results in these two locations.

Upper lid: The duct may drain away the whole tumor, or nearly so, in the form of discharge, but this would be a great rarity; for, as in all sinuses (for such the duct has now become) the purulent evacuations are scant and intermittent, corresponding to the chronicity of the disintegrating softening. During the intermissions, the opening of the gland mouth, is occluded by a small pellicle formed by clotted secretions; it does not re-open until the distension of the duct overcomes the force of occlusion. In this, it merely follows the example of all sinus drainage (anal fistulae, bone fistulae, tear sac fistulae, etc.).

The temporary retention of the discharges may in this manner be protracted to such an extent, that the tissues are greatly irritated both mechanically and biochemically. As a result, the neoplasm seems larger, and is slightly tender, until a new eruption of the pent-up material takes place, which removes both the cause and effect of this condition. Occasionally patients state (and I have been personally able to verify the assertion) that a chalazion "gets smaller at times and then grows again." These fluctuations are readily understood in the light of the

above and, what is more, inspection will usually show the drains. Escape of the whole tumor-substance is exceptional and exceedingly slow, for this intermittent duct drainage is generally accompanied by other *accidents*.

The continued stagnation of the secretions causes dilatation of the Meibomian ducts with pool-like collections of purulent matter and, occasionally, new chalazial foci. In the course of time the fibrous tissue of the tarsus becomes eroded, and the accumulated discharges leak through capillary perforations, thus creating subconjunctival effusions of grayish color and lake-like appearances, while the course of the duct is marked by a dark-red or bluish hue. *Several* subconjunctival pus collections may be observed along the fistulous duct, like beads on a string. The discoloration of the duct-line is due to blood stagnation and the necrotic softening of the cartilage.

The mouth of the gland presents a nipple-shaped appearance, such as *any* fistulous track or sinus elsewhere may exhibit. This is due to the constant biochemical irritation of the discharges causing:

- a. Reactive inflammatory swelling with consequent "lip eversion;"
- b. The sprouting of unhealthy granulations in the form of a wreath around the opening.

The scantily vascular tarsus reacts very slowly, still, whenever one sees a nipple-shaped tip surmounting the orifice of a Meibomian gland, he may be sure that the gland is acting in the capacity of a fistulous drain and that a chalazion (or its remnant) is located somewhere above it. Inspection of the inner, and palpitation of the outer surface will reveal both. Palpation should be practiced with some care, as the chalazial focus may have shrunk to the size of a millet seed or less.

Exclusive drainage through a duct is rare. The internal distension eventually results also in conjunctival perforations. These latter are usually quite small—capillary—and, as chalazial disintegration is so very gradual, it does not furnish enough flow to keep *continuously* open even these small holes. As a result, they become closed by an occluding pellicle which bulges as the accumulating secretions begin to undermine its marginal adhesions. On eversion of the lid they appear like a grayish or yellowish

vesicle of the size of a pin head or slightly larger. When pricked open, the minutest quantity of thin grayish pus emerges.

These conjunctival openings drain very well while not closed, but after evacuation a new film will form over them in twenty-four hours or less. Hence they provide no *ideal* drainage. To this is added the reactive swelling within the infected ducts, which in some places is severe enough to close entirely the glandular lumen. This latter occurrence gives the discoloration along the duct a beaded appearance on account of the alternating inflammatory occlusions and discharge sacculations. The chronicity of the process tends to increase the sacculated dilatations until, by softening of the septal substance, the irritant secretions make irruption into a neighboring gland, which now becomes infected. Thus, the major portion (or all) of the upper tarsus may become involved, bringing about an infection of the whole Meibomian system, which I have designated as tarsadenitis Meibomica.

Consultation by Mr. O., in the fall of 1899, is given as an illustration of this pathogenic eventuation of chalazia:

Near the middle of the upper free border of the left lid a crater-like gland mouth; well above it, a degenerated chalazion, formerly the size of a pea, now not larger than a small shot; between it and the opening, another nodule hardly larger than a millet seed. Bulbar conjunctiva suffused, moderate photophobia, slight lacrimation, sensation of fulness, roughness, smarting and itching about upper lid. The latter considerably swollen, droops, and is tender to touch. Eversion (painful) exhibited: mushy swelling of conjunctival epithelium with dark red discoloration, a good deal of papillary roughness, and—a characteristic feature—an appearance simulating alligator leather, which was explained by the circumstance that the great inflammatory tumefaction over the infected glands made that surface stand out prominently, while the non-infected ducts, in the absence of swelling, looked like raphes between the infiltrated areas. In these different places were seen small grayish vesicles about the size of a pinhead. Puncture allowed the escape of a quantity of discharge hardly appreciable, but compression brought out a small drop. In places the cartilage had thus been separated into two

laminae, the inflammatory softening having admitted not only of irruption into neighboring glands, but of total removal of the septal tissue with free communication between distant intra-glandular spaces. At the same time conjunctival perforation had occurred, the little vesicles being merely fistulous drains with their occluding pellicle distended.

A 5 per cent. solution of protargol injected into one perforation would emerge freely from the others. To get at the fountain head of the trouble, I opened and scraped the tumors and then continued intraglandular lavage with the silver salt. *All* openings were injected, the duct-orifice included, as there was found occasionally partial clogging from any *one* point.

This at once relieved the subjective symptoms, though the reaction rather aggravated the swelling and the flow of the pus for the first few days. It also changed the color of the morbid secretions from an ashen gray to a light yellow.

After three weeks, neither pressure nor lavage produced pus, though the lid was still much thickened. In the absence of subjective complaints, treatment was considered finished.

It must be admitted, however, that from an idealistic point of view the cure was far from satisfactory, as the induration of the lid did not entirely disappear.

He also had a second attack of this trouble in the fall of 1900, but now does very well again. Meanwhile two more chalazia formed on the lower lid (same side); removed.

I have treated four cases of tarsadenitis, all in the last three years. Two of them had been treated for granulated lids. They are usually *overlooked* (in the true etymologic sense of the word) and then mistaken for another affection, mostly trachoma.

A neglected case of tarsadenitis may break through externally and then all symptoms are attributed to the subcutaneous abscess.

It is interesting to note how the master mind of the great observer, Prof. Fuchs, views this condition. He says in his most admirable text book: "In particularly bad cases an actual degeneration of the lids, *especially the upper*, takes place. The lids are thickened and are everted only

with difficulty. The skin forms *nodular projections*, but can be displaced upon its bed and it is not essentially altered, etc." (After giving a full clinical picture)—"In such cases we might at first sight be disposed to think of tarsitis or a neoplasm."

He notes this occurrence "especially in the upper lid" and also the presence of *nodular projections* in the skin, but hastens to add that the latter is not essentially altered.

Now, as a matter of fact, the degenerated chalazia (and secondary granulation foci below them) *do* feel like nodules in the skin and *seem* to slip with it, but *critical examination*, with the tarsus steadied, will demonstrate that they are in the structure of the *latter* and *not* in the *skin*. Incision will prove them degenerated chalazia.

Prof. Fuchs, also notes the nipple-like mounds around Meibomian orifices. "Those chalazia which develop in the excretory ducts of the Meibomian glands assume a special appearance. They are then situated near the free border of the lid, from which they project like a nipple".

He seems to take the crater-like mound for protruding tumor substance, when as a matter of fact, all fistulous tracks of sufficient chronicity will develop such appearances. There is truth in the statement that a chalazion low down in an excretory duct more readily produces this nipple feature, but simply because the duct in this region does not close as readily by reactive inflammation on account of its larger lumen, and shorter distance, hence *continues* its fistulous function more regularly than would a *longer and thinner* duct from away above, which is more apt to establish auxiliary drainage by perforations through the conjunctiva all along its route.

Still nodules near the free border are usually *secondary* foci, for searching palpation often reveals the tumor (primary) above, but even if not felt, its former seat is indicated by the characteristic conjunctival discoloration.

The frequent occurrence of unhealthy granulations after conjunctival perforations (surgical or spontaneous) is known and mentioned in practically all text-books, but as general as their mention is also the belief that these granulations are merely eversion products from the tumor. The fallacy of this assumption is evident from the following facts:

1. Chalazial granulations are very pale and almost avascular, while the newly-formed variety is *typical* "proud flesh" (red and quite vascular).
2. The perforation is usually very small, but careful observation shows the lumen free and unobstructed.
3. The granulation masses are connected with, and spring from, the macerated edges of the conjunctiva around the fistulous perforation and not from within.

It is only a step between granulation masses and pedicular polyps—a matter of form only. "Le pourtour du trou de perforation devient ordinairement le siège des bourgeons charnus pediculés qui par la pression du globe oculaire se trouvent fortement aplatis."—DeWecker.

This flattening is the rule, but there may appear, chiefly on the lower lid, polyps of perfect club-shape.

I know that the regular conjunctival polyp (pale-red, with surface strawberry—rough, and springing from the internal canthal parts not external to the puncta lacrimalia) is very rare. The only case of this type ever seen by me was in the clinic of Prof. DeWecker, 1887-88; but there is a polyp of darker hue (purplish), with smooth lining, arising from the conjunctiva external to the lacrimal points and ordinarily below the free border, rather more frequent.

Example: Mr. X., hotel steward. Except for a little bulging of left lower lid, eyes apparently normal. Free lid borders closely on eyeball and in regular position, but downward pull on the lower lid caused full eversion with "springing out" of a beautiful specimen of a club-shaped polyp. The latter was of dark red color, smooth surface, and attached by a narrow pedicle to a point nearly presenting the true center of the tarsal cartilage. Patient informed me that a similar growth had been removed several years before and that this one was a recurrence of it. He had no annoyance from it and very little disfiguration, but desired it removed, because the tumor would unexpectedly spring out when he wiped his face or nose. It was as readily replaced. When after excision the bleeding stump was flooded, a small gray fistulous opening appeared in the center. Exploration showed an old disintegrating

chalazial sac below, which was laid open and scraped, while the pedicle was well cauterized.

The fistulous track emerged on one side of the pear-shaped tumor at a point about one-fourth inch from the attachment. The total length of the polyp was one-half inch, its maximum thickness one-fourth inch.

In the lower lid, gravity actually opposes elimination, while the limited lid motion and ineffectual orbicularis compression are unable to clear the fistulous lumen, hence the latter remains filled and distended constantly, although intermittently discharging. This leads to great circumfistulous plastic effusions with consequent induration. In the upper lid, induration to such an extent is almost impossible, since the lid motion and orbicularis contraction so scatter and diffuse morbid secretions that the chronic induration has not time to develop and protect the surrounding tissue from invasion. In a manner, therefore, the induration *below* must be taken as a circumstantial analogue of tarsadentis *above*.

The induration may surround an efferent duct around whose orifice the cartilage is much thickened and raised up in mound-like fashion. External palpation then gives the sensation of a buried shot. However, if perforation of the cartilage occurs (usually near the free border on the outside) there develops in the skin a small nodule of induration with or without drainage, usually the latter. These shotlike indurations are externally visible as small hemispherical projections and have been called internal styes. They closely simulate a forming abscess, especially on account of the small grayish pellicle surmounting the fistulous mouth like a vesicle. Sometimes a yellowish pus focus seems to shine through, but incision fails to give matter. They may look red and inflamed, but as a rule do not. The laity invariably mistake them for styes. They may be artificially produced when in extirpating a chalazial tumor the cartilage be perforated and the granulomatous masses imperfectly removed.

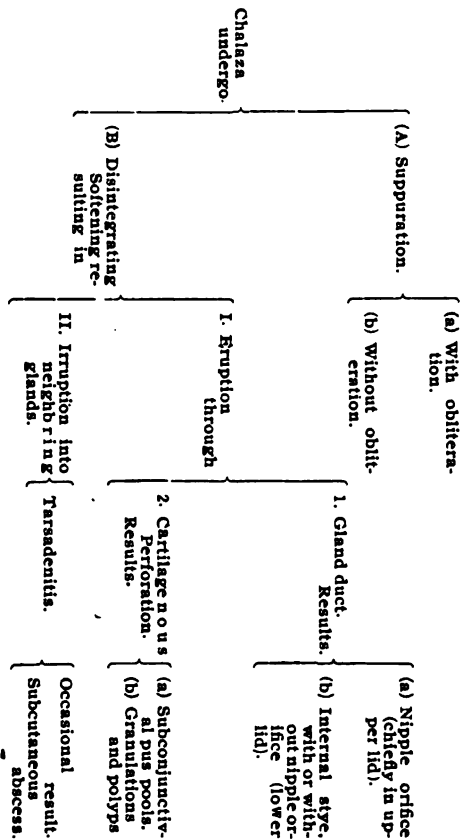
In 1899 I removed two chalazia from the lower lid of a young man. I enucleated, i. e., divided the conjunctiva in a bitemporal sense and dissected it loose both below and above till it cleared fully the tumor. The latter was then grasped with a long-toothed fixation forceps and cut

out with the scissors. This included the cartilage. Some two months after the conjunctival incision had well closed, an external styte appeared above. A small nodular mass below showed remnants of chalazial tissue.

Near the inner punctum of the lower lid, fistulous tracks may cause a great deal of local diffusion by perforation. On eversion we see specks of subconjunctival discharge collections, and the lid presents a great deal of thickening and induration. This may take on sudden acute infection (superinduced probably by staphylococci).

This represents the so-called suppurating internal stytes. It will be noticed that in many cases a great amount of swelling remains, often with eversion of the punctum inferius lacrimale, after the suppuration has run its course. Chalazial tissue may even then re-accumulate.

PATHOGENETIC TABLE.



THE TREATMENT OF RECENT EMBOLISM OF THE
RETINAL ARTERIES BY DEEP MASSAGE, WITH
REPORT OF TWO CASES CURED BY THIS
METHOD.

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CHRONIC INSANE, TO THE TRINITY HOSPITAL
ETC., ETC.

I have recently had opportunity to examine and successfully treat two typical cases of thrombosis of the central artery of the retina mainly by the method of deep massage as demonstrated by Dr. Casey A. Wood, (Ophthalmic Record, June, 1899. A Contribution to the Treatment of Embolism of the Central Artery of the Retina).

Case I. At first total embolism from menstrual period, complete recovery.

May 8th, 1901, Mrs S. A. M., age 29, Ft. Atkinson, Wis., was referred by Dr. Perry on account of sudden and total loss of sight in the right eye six days before, immediately following the menstrual period. Examination of the heart, lungs and urine revealed nothing abnormal; the patient was otherwise in good health. She had usually some dysmenorrhea. Externally the eyes were normal; the pupil of the left responded only consensually to light and accommodation; the eye was totally blind, the patient being unable to see the difference between darkness and intense light; ophthalmoscopic examination showed typical embolism of the central retinal artery, the veins being engorged and none of the arteries carrying blood; the macula showed the characteristic red spot and there was edema of the retina. The picture was one of complete blocking of the nutrient artery some distance back of the nerve head.

At the time of the examination, deep massage was first used; this consists of placing the ball of the operator's thumb upon the upper lid of the closed eye (Wood uses the second finger) and forcibly, with slow movement, exerting pressure upon the eyeball for two minutes. Ophthalmoscopic examination being made immediately afterward showed that the arteries were carrying blood and that the veins were less engorged and that the eye could detect the difference between light and dark. As the case was of such recent occurrence and the immediate effect of the

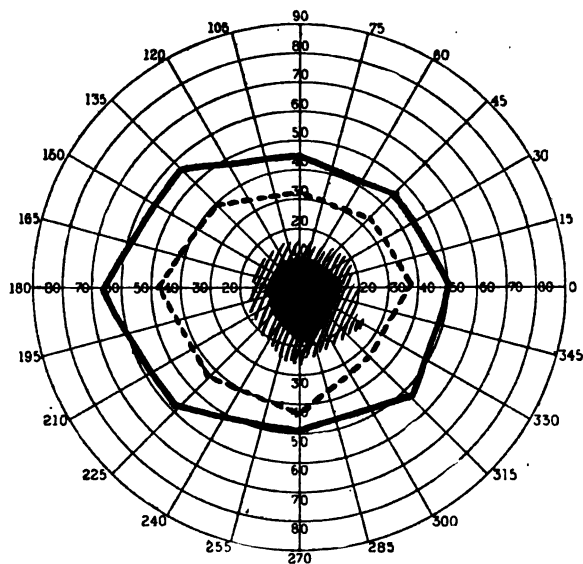


Fig. 1. Case I. May 24, 1901. Central and Absolute Relative Scotoma. V = Fingers at 2.m.

massage so apparent a guarded through favorable prognosis was given, the patient sent to the hospital and the eye again massaged that evening in the same manner. The massage was kept up for one week, treatments being instituted twice daily. In addition to the local treatment, pilocarpine sweats, dose gr. $\frac{1}{6}$ hypodermically, followed by hot bath were given for five consecutive days; 1 oz. Rochelle's salts was given morning and evening and after five days, increasing doses of iodid of potash, 0.50 to 2.0 *pro dosis* were given internally and the patient kept in bed; hot compressing was likewise resorted to, the compressing being

done every third hour for one half hour at a time during the day.

The object of all this treatment was: 1. To dislodge the clot and break it up by the deep massage. 2. To stimulate the excretions and produce rapid change in the blood so as to secure absorption of the clot. The results were as follows:

The patient stood six days rather severe treatment very well, with no special weakening, and has since been *in the best of health*. As regards vision, the perception of light

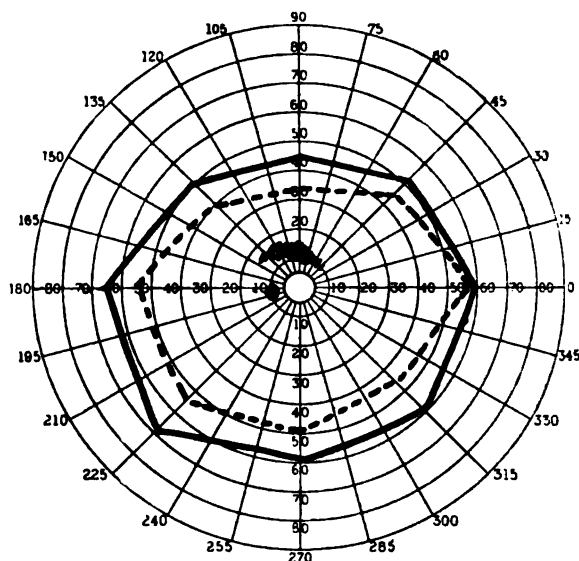


Fig. 2. Case I. June 8, 1901. Para Central Relative Scotoma.
 $V = -6/VI$.

returned within 24 hours; one week after treatment was instituted she could see large objects; on the 17th inst. she could see small objects and was sent home to continue the internal treatment and to have the massage practiced by her physician, the pilocarpine and hot compressing being stopped. May 24th she could count fingers at 2 m., see small objects and the field of vision was good; at this time the visual field was accurately taken (see Fig. 1) and showed central scotoma extending 10° from around the fixation point; the patient returned home and again came June 8th, when the vision was found to be $6/VI$ and Snel-

len 0,50 was read at 0,50 cm. Visual field was perfectly normal except that, with pin-head disc, there was a slight epicentral blurring which could be considered the remains of the once extensive scotoma; (see Fig. 2) the fundus was not quite normal, the macular artery being seen to be partially obliterated.

My friend, Dr. C. F. Clark of Columbus, O., and my associate, Dr. N. M. Black, at this time saw this case in consultation; medication was withdrawn and patient put upon bromide of gold, arsenic and mercury, of each gr. 1/50 *pro dosis*; since that time the eye is believed to have been perfectly normal.

Case II. At first total, subsequently partial embolism. Cardiac disease (?) Nearly complete recovery.

August 8, 1901, J. W., Evansville, Wis., came stating that he had become suddenly and totally blind three weeks before, not being able to see the difference between light and dark until one week later when he commenced to see light. He said that he had heart trouble but physical examination failed to reveal any organic lesion; examination of urine gave normal results.*

On examination, the right eye could see the movement of hand and large objects; the vision of the left was 6/VI, the pupil reacted to both light and accommodation but to light more slowly than the left and more freely from the temporal than the nasal side; the reason for which will be seen later. Ophthalmoscopic examination showed embolism of the superior branch of the artery and of the macular branches, the circulation of the lower part of the retina being practically normal. There was but little tortuosity of the veins and there were slight hemorrhages in the retina above the macula. These conditions evidently showed a blood clot near the nerve-head, it not fully occluding the circulation. The patient was put upon similar treatment to that of the first case. The effect of the deep massage being to immediately increase the caliber of the arteries and to show blood current in the vessels which before were not carrying blood. In this case, as the circulation had been obstructed for three weeks, a

*On a closer inquiry into personal history, the patient admits he is a hard drinker.

guarded prognosis as to improvement was given, but such improvement occurred even more rapidly, although not as complete recovery has taken place as in the first case. The patient remained at the hospital for one week and on account of business insisted on returning home, he then being gratified to find that the sight was returning and that he could count fingers at 3 m. with the affected eye but only toward the temporal side. Examination of the fundus showed that collateral circulation was forming, the superior vessels now carrying blood in part, the macular

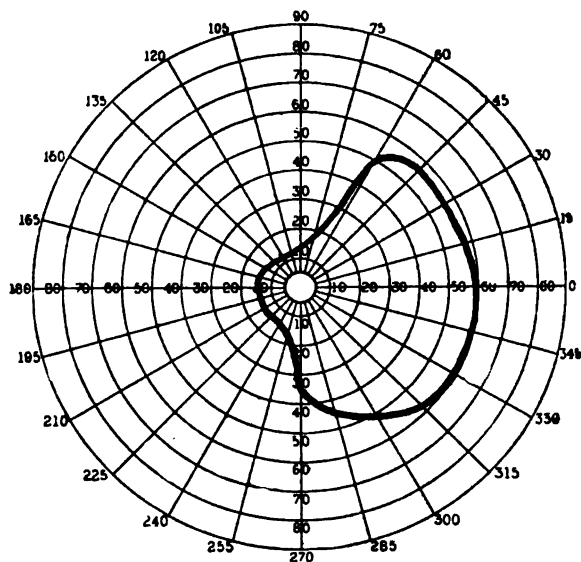


Fig. 3. Case II. Aug. 22, 1901. Temporal Hemianopic Field.
V = 6/LX.

vessels yet remained empty; the small hemorrhage above the macula was being resorbed and no new ones had taken place; this is noteworthy considering the amount of force that was used in the deep massage. He was given increasing doses of iodid of potash to use at home and was instructed to rub his eye himself, to continue the hot compressing and to return here, which he did Aug. 22nd, when the vision was found to be 6/LX, that he could see Snellen 0,50 at 0,50; the visual field was hemianopic (see Fig. 3) but the central vision had recurred; ophthalmoscopic examination showed the circulation not restored as the fila-

ments of the superior retinal arteries were not carrying blood; there was a large pigment stain at the region of the infra-macular hemorrhage. The patient was gratified with the results of treatment but on account of business and finances will probably not return for further examination or treatment.* He was prescribed iodid of potash in 0,60 doses to use for one month, to continue rubbing the eye and using the hot compresses for two weeks. Report of this case is, of course, incomplete, but as I may never see him again is appended as it shows the distinct value of the above form of treatment in cases, that until recently, would have been given a most unfavorable prognosis as regards return of vision.

RESUME.

These two cases were typical of retinal embolism; the first being complete, the entire retinal circulation being obstructed at the time of examination, and the latter incomplete. The results of the treatment are believed by the writer to be mainly due to dislodgement of the blood clot by means of the renewed blood supply. Starvation of the nerve cells of the retina was absolutely complete in the first case and but partial in the second, the return of visual function being, in the former, complete, and in the latter, incomplete. The drug treatment should not be given the credit of the cure although it is believed that it proved of material assistance by elimination and change of the blood. I have never had such success with drug treatment alone and thus ascribe the cure to be due largely to the mechanical treatment.

*Sept. 12th, 1901, patient returned under influence of alcohol. Ophthalmoscopic examination showed arteries obliterated and numerous small fresh hemorrhages in macular region and one large one directly above disc. V. excentric gives 2/LX.

OPTIC ATROPHY FOLLOWING HÆMATEMESIS.

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Michael R., age 52. Baker, unmarried. Gave the following account of his illness. He was well till three months ago, when he noticed shortness of breath on exertion and severe burning pains at times, across the chest. He then came to Melbourne from Avoca and drank heavily for a month. He experienced an attack of vomiting, the ejecta forming a greenish mass, followed by about a pint and a half of blood. Patient then fainted and was carried into an hotel. He was able to walk later on in the day, and also next day, but on the third day was unable to walk more than a few yards by himself. On the fourth day he was sent in a cab to the Melbourne Hospital where he was admitted as an in-patient under Dr. Williams. Vision was unaffected till three days later, i.e., seven days after the vomiting, when, while patient was reading a paper, a cloud gradually came over the right eye. Next morning the vision had failed in both eyes, so that he was unable to distinguish daylight from dark. He thinks that his vision has somewhat improved since. General health has been very good. Thirty years ago had an attack of gonorrhœa the urethral discharge lasting two months. Has had no chancres. He suffered from cramps in the legs for years, but otherwise has been in good health. Father dead, from cause, and at age, unknown. Mother died at the age of 94. Three sisters are alive and well. One sister died at the age of 36, cause unknown. He was examined at the Eye and Ear Hospital on May 25th, i.e., thirty four days after the failure of vision. The pupils were half dilated. They did not re-act to light and acted very feebly during accomodation. The vision was nil in each eye. Both discs were white and defined, presenting the

ordinary appearances of atrophy. The vessels on both sides were small, especially the arteries. To the outer side of the right disc, between it and the macula were a few discrete white spots, apparently atrophic. Dr. Gault examined his eyes at the Melbourne Hospital on the day following his attack of blindness, and then found the pupils were equal, and moderately dilated, and did not contract on exposure to light reflected from the ophthalmoscope. The media were clear. The margins of the disc were lost in a milky haze, which extended for about a disc breadth around the discs, and was somewhat sharply contrasted at its edges with the surrounding clear fundus reflex. There was not more than a diopetre of swelling, and no change in the vessels could be detected. There were no retinal hemorrhages, or changes in the macular regions. He examined him after eight days and found that the margins of the discs had nearly cleared up, and were becoming somewhat pale, but there was no decided reduction in the size of the vessels.

The following notes are taken from the Melbourne Hospital case book with the kind permission of Dr. Williams.

Michael R. on admission (April 19th) complained of vomiting. Fortnight before admission was also troubled with vomiting. Tuesday before admission vomited blood once, about one pint, never did so before and never since. Vomiting has no relation to food. History of melæna. No enlargement of liver. No epistaxis. History of alcoholic habit. Pulse full and strong. Arteries rigid and cord like. Heart sounds clear. Urine, S.G. 1018 Acid. No albumen. History of polyuria.

21/4/01. Complained that he could not read well on account of dimness of vision. This began in the morning. The vision gradually grew worse.

22/4/01. Afternoon of this day could see nothing at all.

23/4/01. Eyes examined by Dr. Gault. Both discs swollen and woolly. No hemorrhages or patches of retinal effusion seen.

Vision = bare perception of light. Pupils inactive to light and dilated—almost 5 or 6 mm.

4/5/01. Urine, 1017. Acid. No albumen.

At present the liver seems a trifle small and tucked up under the ribs. The arteries at the wrist are tortuous. No

evidence of atheroma in temporal arteries. Heart sounds clear but faint. Chest sounds normal. Urine.—No albumen, no glucose. The patient is now apparently a broken down man.

It is quite obvious that in this case the appearance could be described as neuro-retinitis, at all events, in the sense in which the term is usually employed. The symptoms were akin to a limited presentation of those usually seen on an extensive scale in embolism of the central artery or rather in that clinical group which is usually supposed to be caused by embolism.

This case forms one of a remarkable and interesting series. Fries collected 106 cases in the literature of 235 years, 1645—1875.

The causes were:—

Table.	Hæmorrhage from the intestinal tract	35.5%
	From the uterus	25%
	Artificial blood letting and especially venesection	25%
	Epistaxis	7.3%
	Wounds	5.2%
	Haemoptysis	one case.

It is noteworthy too, that no case occurred during the Franco-Prussian war. Since this publication thirty six cases have been published, the notes of which (in the original or abstract) have been available to me.

The causes have been:—

Hæmatemesis.....	17
Various forms of uterine hæmorrhage....	13
Urethral hæmorrhage.....	2
Epistaxis.....	2
Intestinal hæmorrhage.....	2

The time which elapsed between the hæmorrhage and the onset of subjective blindness (not the temporary amblyopia of exhaustion) in twelve cases varied from forty hours to nine days, the average being four and a half days. In another case, caused by post partum hæmorrhage, the blindness developed nearly three weeks later.

Fries found the usual time to be three to six days.

The ophthalmoscopic appearances seem similar:—usually a disturbed disc with loss of sharpness of outline, and some white edema of the retina in its vicinity. But

in some cases the disc disturbance was so profound that it became simply the place of emergence of vessels. In the severe cases the veins were sometimes swollen and tortuous and hemorrhages frequent.

The term neuro-retinitis is often employed by observers who nevertheless show themselves to be uneasy respecting the pathologic diagnosis. The end in the severe cases is always the same—very rapid atrophy, narrow arteries, sometimes white spots in retina, and a half dilated, immobile pupil.

There have been two microscopical examinations, one by Ziegler 23 days after the onset of blindness. There was no trace of hemorrhage into the sheath of the optic nerve which itself was completely atrophied. The medullated sheath of the fibres enclosed multitudes of large and small oil globules.

The other was by Hirschberg three years after the attack of blindness. Before death the pupil was inactive and the papilla atrophied. In the left eye the disc was a little white, but during the attack three years before, the left disc was divided into two parts by an oblique line. The lower and median portion was white and from it spread the white disturbance into the retina. On examination, the right nerve was completely atrophied. In the left nerve, there was atrophy of definite bundles involving one-third of the circumference and one-eighth of the thickness. The portion of the papilla above referred to was atrophic.

Hirschberg, whilst describing the case as one of undoubted neuro-retinitis, especially in the right eye, comments on the fact that fourteen days after the hemorrhage, (nine days after subjective blindness) the neuro-retinitis had disappeared, leaving an atrophy on the right side and a nearly normal disc on the left.

Two other cases deserve special note.

Hoffman narrates a case in which the upper part of the disc was pale and the lower half of the field had gone. Fries records a case in which the lower half of the field had gone and the upper half of the nerve was atrophic. It should be remembered that the two eyes were often attacked unequally, and that very rarely, if ever, was the onset of blindness sudden in the sense that one uses the term in connection with embolism of the central artery.

It is obvious that the lesion must be below the commissure, since no bilateral lesion above or median lesion at the commissure could well produce these results, without causing other symptoms. The extreme rapidity with which the atrophy is developed practically determines the seat of lesion, to that part of the optic nerve supplied by the arteria centralis retina.

Anatomical examination shows that it is not hemorrhage within the sheath. What is it? Something which produces an atrophy with a rapidity equalling that of atrophy following embolism.

In thinking the problem out, it may be as well to bear in mind the following considerations: That spasm of the retinal vessels is sufficient to arrest the retinal circulation, (Benson Noyes), and that in three of the eyes examined after embolism resulting in blindness, no obstructions to the vessels could be discovered (Hirschberg, Loring & Popp), that in three others (Schnabel & Sachs, Elsching & Wagemann), the embolism was partial. In one case, of Schnabel & Sachs, the vision was permanently lost, and yet the retinal vessels were normal in appearance two and a half hours after the attack. An atrophy occurring in fourteen days (Hirschberg) is practically unknown after any other form of neuritis, and the cases already referred to in which half of the nerve, or a smaller portion had been picked out and destroyed, does not suggest an ordinary case of neuritis or neuro-retinitis, at all events as we usually imagine it.

It seems to me, therefore, that if we have to do with real primary neuritis, and not with neuritic changes consequent on purely circulatory phenomena, it must be caused by the exudation of toxins of extraordinary local virulence which practically kill the nerve at once. Improbable as the existence of such a selective agent may seem to be, it must never be forgotten that alcohol, tobacco and other dissimilar chemical substances agree in picking out a few fibres in the optic nerve, which, so far as we know, do not differ in anatomical and chemical characteristics from those around them.

I am more inclined, however, from a survey of the evidence, to think that the explanation will be found in a combination of vascular factors, operating on a terminal

arterial system. Altered blood, disturbed nutrition of vessels, spasm, and possibly thrombosis of the artery or vein.

The solution will be rendered more easy when we possess definite information respecting the physiological characters of the blood during recovery from hæmatemesis or metrorrhagia.

I have to express my best thanks to Dr. Williams, Dr. Faucet and Dr. Ore for assistance rendered in connection with the foregoing.

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RESIDUAL SENSATIONS AS A TEST FOR DIPLOPIA
WITH DESCRIPTION OF A NEW METHOD FOR
MEASUREMENT OF OCULAR MUS-
CLE IMBALANCE.

BY CLINTON F. COOKE, M. D.

I desire to make a preliminary report on a method of eliciting diplopia, which has come to my notice in searching for the cause of a muscular asthenopia where the usual tests with flame and colored glass, the double prism, Maddox's rod test, Von Graefe's linear equilibrium test and the movement of redress upon alternate covering and uncovering an eye, all gave completely negative results.

This test is supplementary to those above named and being entirely subjective and dependent consequently upon the intelligence or goodwill of the patient is therefore not universally applicable. That it has nevertheless a distinct value in properly selected cases is I think demonstrable.

The explanation of its operation is, in the writer's opinion, to be found in the existence of a more perfect balance of the ocular muscles while the eye is closed than while open even though the light be kept from the retina by a screen.

During relaxation of the levator palpebræ the tendency to fusion of the images is less strong than during its contraction.

The method of application of this test in a case of muscular imbalance is as follows: The patient being in a darkened room and any existing ametropia corrected, is seated, say six meters from a screened flame, the screen having a perforation one millimeter in diameter.

Both eyes being in the primary position are fixed upon the opening in the screen, the patient is requested to close the eye under examination for a period of two or three seconds. Upon opening the eyes a second point is observed at a variable distance and direction from the one seen by the eye which has remained open. This second point rapidly

moves toward and fuses with the first point, the movement occupying a period of time estimated to be from one-quarter to one-third of a second.

From the direction of this movement the position of the eye while closed may be deduced and the insufficiency located.

As an example let me report the following case, D. T., age 34, American, ocular history negative until 1892 when he became myopic, has worn — 1.00 d. s. since then. Of late has had occasional attacks of sick headache after riding on cars or in a buggy, complains also of transient dizziness while reading when he moves his eyes from one side of the page quickly to the other or looks quickly from some one object to another. Cannot say just what movement of eyes does this. No diplopia in any position, no astigmatism, $V = 6/21$, $M = 1.00$ D corrected $V = 6/5$. The first mentioned tests show absolute orthophoria but the pinhole test shows O. S. transient diplopia, image moves downward and outward in a curved line having its convexity upward, to the point of fusion. O. D. no diplopia.

The eye has therefore been directed downward and outward while closed and has moved upward and inward. Movement of the pupil downward and outward is accomplished by the superior oblique. Spasm of the superior oblique would become more manifest upon attempt to use this muscle, and paresis of its antagonist the superior rectus would become more apparent as the eye moved further in its line of action.

The patient is therefore directed to turn his face to the right slightly and to incline it upward slightly whereupon his diplopia does not appear on application of the test.

On turning his face slightly downward and to the left his diplopia increases or rather, movement through a greater arc occurs.

Upon strict lateral movement of the face the diplopia disappears when the face is turned to the right and remains unchanged when the face is turned to the left.

In reviewing these findings it is evident that a paresis of an elevator has allowed the eye to deviate downward and that a paresis of an adductor has allowed it to deviate outward. The elevators of the left eye are the inferior oblique

and the superior rectus. The adductors are the internal, inferior and superior rectus.

If the internal rectus alone were weakened the eye would deviate outward on a horizontal plane. If the superior and internal rectus were both involved the movement would be downward and outward with divergence of the upper end of the vertical meridian the divergence increasing as the pupil was moved upward and inward.

The superior rectus is both an adductor and an elevator and a paresis of it would result in the movement described, namely, the opposite of the false image or upward and inward by a distinctly curved line.

Whether the curve is a resultant of the combined forces tending to draw the eye upward and inward during the attempt at fusion of the two images or to a rotation of the eye on the visual axis, the movement of torsion—requires consideration. This question in an analysis of this case necessitated a modification of the method of producing diplopia, namely, the substitution of small crossed lines for the pinhole in the screen.—The writer now uses, for this purpose, a screen having an opening shaped like a Swiss cross, each arm of which is one millimeter wide and six millimeters long covered with yellow tissue paper or ground glass to diffuse the light and avoid as much as possible the rays due to the normal irregular astigmatism.

The delicacy of the pinhole test being due largely to the persistence of retinal images of the moving point of light it is necessary both for avoidance of confusion and to increase the accuracy of the patient's answers to place a red glass before the eye to be tested while using the crossed lines. In the case cited the crossed lines showed no divergence of the upper end of the vertical meridian, thus eliminating torsion and the internal rectus from the case, as the superior oblique would probably not be able alone to prevent the negative rotation or torsion of the eye in case of combined paresis of both superior and internal recti.

In the case reported, in the primary position, the distance between the true and the false images was three centimeters in three meters horizontally and two centimeters in three meters vertically, consequently a one centrad prism base at 120 caused the diplopia to disappear except, of course, in the line of action of the superior rectus.

An inquiry into the history made rheumatism a possible etiological factor and suitable treatment of this, and orthoptic exercises, were prescribed.

In regard to this test it might be said further that the patient should be placed close enough to the screen to eliminate largely the rays due to irregular astigmatism and in case of high ametropia the prismatic action of the lenses must be taken into account.

Recapitulating, it may be said: 1st, the ordinary diplopia test of candle flame and colored disc may be improved upon by substituting a point of light or the crosslines described, for the reason that persistence of the images is greater with the smaller luminous point and because with the larger retinal image of the flame the relatively less sensitive peripheral portions of the retina are used. 2nd, the ordinary tests for insufficiency may be overcome by the strong desire for fusion of the images.

The diplopia, which is always present in imbalance, upon opening the eyes, is almost instantly removed by the muscles and passes unnoticed ordinarily both by exclusion of the moving image and because of its short duration, but may be made manifest by a luminous point the after image of which remains about $1/4$ of a second.

For qualitative estimation I prefer the point of light but for quantitative the cross is better. Three millimeters deviation in three meters distance is easily seen and measured, thus measuring one-tenth centrad of deviation. For ease of application, inexpensiveness of apparatus required, and accuracy of results this supplementary method is confidently recommended.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

BY

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NEW YORK,

ASSISTED BY

WALTER F. MACKLIN, M. D.,

NEW YORK.

(Quarter Ending September 30, 1901.)

Tuberculosis of the Choroid.

CARPENTER, GEORGE, London and STEPHENSON, SIDNEY, London. (*The Lancet*, July 20, 1901.) The writers point out that there is no general agreement either as to the ophthalmoscopic forms which tubercle may assume or as to the precise conditions under which they may occur, these omissions being due to the difficulties attending an ophthalmoscopic examination of young children with tuberculous meningitis and to the fact that a single observer is scarcely likely to come across many cases of choroidal tubercle. They record their personal experiences based upon the study of 49 cases of tubercle of the choroid. These cases are grouped as they were met with clinically, in (1) acute miliary tuberculosis and tuberculous meningitis; (2) chronic tuberculosis, medical and surgical; and (3) obsolescent tuberculosis.

Acute Miliary Tuberculosis and Tuberculous Meningitis. Out of 42 unselected cases examined with the ophthalmoscope, 21 were found with tubercles of the chorioid (50 per cent.); in 13 of these cases in one eye only, in 8 in both eyes; in 18 eyes the lesion was solitary, in 11 eyes it was multiple (usually two or three). The tubercles usually took the form of round, oval, or reniform areas, of a fawn, grey or paper-white color, with "moth-eaten" edges sur-

rounded by a narrow zone of darker color. The amount of pigmentation appeared to bear some relationship to the size of the tubercles since it was generally absent from the smaller nodules; the latter could not be distinguished from any other chorioidal exudation; the tuberculous nodules were, however, never framed by a thick border of pigment such as is present in ordinary disseminated chorioiditis from syphilis. The center of some of the tubercles was marked by a tiny, white, shimmering dot. The retinal vessels passed over the nodule without loss of definition, the tubercles were seldom much raised above the level of the retina. In eyes where the chorioidal vessels were unusually distinct these were seen to terminate abruptly at the edge of the tuberculous lesion. The tubercles were generally found only in the immediate vicinity of the disc and macula. In size, the tubercles ranged from a fraction of a millimeter to 3 mm. A statement has been made that chorioidal changes are commoner in tubercle without than with meningitis; but the writers' figures lend no support to this generalization. The period elapsing between discovery of the ocular changes and death ranged, in 14 fatal cases, from one to 43 days, from which the conclusion is arrived at, that tubercle of the choroid is not necessarily a late symptom.

"Our figures prove that choroidal changes are frequently present in acute tuberculosis. Indeed, in our opinion, they form perhaps the most trustworthy sign of that disorder, the diagnosis of which as we all recognize, is often most obscure. Attention is sometimes drawn to a discrepancy between the alleged infrequency of the ophthalmoscopic discoveries, on the one hand, and the frequency of the pathological findings on the other. Admitting the truth of this view, which, in the light of our present figures, we do with some little hesitation, there are several points to be borne in mind. Tubercle, although present, may lie in the anterior portions of the choroid coat beyond the range of the ophthalmoscope, as we have ourselves found. If the nodule is not large enough to cause disturbance of the over-lying retinal pigmented epithelium it can scarcely be visible with the ophthalmoscope, although it may be found on post-mortem inspection when the retina is removed. It seems likely that the rapid appearance of fresh tubercles

mentioned by many writers is to be explained by an acute disintegration of the pigmented epithelium rather than by a presumed unusually sudden appearance and rapid growth of the nodules themselves. Then there remains, last but not least, the personal factor which is certainly not without influence when it comes to examining the eyes of a young and troublesome child with the ophthalmoscope. In short, we repeat that careful ophthalmoscopic examination will show tubercle of the choroid to be quite common in acute miliary tuberculosis, since it was present in 50 per cent of our cases."

Chronic Tuberculosis, Medical and Surgical. Choroidal changes were found in 11, or 9.24 per cent., of 119 cases of chronic tuberculosis in children examined with the ophthalmoscope. The choroidal lesions fell into four groups, viz., (1) solitary, (2) the multiple, (3) the disseminated, and (4) the diffused. The solitary and multiple resembled those described in acute tuberculosis. There was only one case, each, of disseminated and of diffuse tubercle.

Obsolescent Tubercle. "In examining eyes systematically one sometimes comes across unsuspected changes of a coarse character which are far more likely to be due to quiescent tubercle than to anything else. In the absence of a pathological examination it is, of course, impossible to be dogmatic on this point, but the family history and the physical examination of the cases render such an explanation something more than merely probable." The writers refer to notes of 16 such cases and briefly cite three of the more typical. "We have notes of 13 other cases, but we will merely say that the essential ophthalmoscopic characters of obsolescent tubercles in the choroid appear to us to be (1) their central position in the fundus oculi; (2) their large size and presence in one eye alone; (3) their characters—namely, a central atrophic area, enclosed by a pigmented figure, and often surrounded by a zone of altered chorioid; and (4) the fact that they are sometimes associated with tiny atrophic spots in their vicinity, doubtless representing their former satellites."

The paper concludes with the following *summary*:

"1. Tubercle of the choroid may be met with in any form of tuberculosis, whether acute, chronic, or obsolescent. 2. It is common in acute miliary tuberculosis and tuberculous

meningitis, since it was present in 50 per cent. of our cases. As a rule the lesion was of small size, solitary, and limited to a single eye. 3. It is far more frequent in chronic tuberculosis than is generally supposed. It was present in 9.24 per cent of our cases. The tubercle in this form of disease may be single, multiple, disseminated, or diffused. In very rare instances it may attain great dimensions and eventually even perforate the tunics of the eyeball. 4. It is present in a certain number of cases of quiescent tuberculosis. It then generally takes the form of a large more or less pigmented area situated in or about the central region of the fundus oculi, with or without satellites”.

Albuminuric Retinitis and Uremic Amaurosis, With Special Reference to Their Occurring in Pregnancy.

CLAP, EDMUND W., Boston, (*Boston Med. and Surg. Journal*, July 11, 1901.) This article is a thorough presentation of these subjects based upon an examination of the literature for many years. It deals with the occurrence, symptoms, pathology, prognosis and treatment. The writer sums up as follows:

“Both albuminuric retinitis and uremic amaurosis are rare conditions in pregnancy, but very important when they do occur. Albuminuric retinitis is a disease accompanied by immediate visible changes in the eyes. Albumin is always present in the urine. It may occur at any time during pregnancy, especially beginning during the first two months or after the sixth month. Its prominent symptom is gradual failure of vision. It is very apt to recur in successive pregnancies, though not necessarily. Blindness is almost never caused by the first attack, but more and more damage is done by each recurrence.

“Uremic amaurosis is a disorder of the visual apparatus not accompanied by immediate visible signs in the retina, although it may finally lead to atrophy. It occurs late in pregnancy, usually with other signs and symptoms of eclampsia, so that it seldom has to be considered alone. It apparently never destroys vision by the first attack. Like albuminuric retinitis, it is very apt to recur in subsequent pregnancies.

“The treatment of both conditions is the treatment of the albuminuria and no use of the eyes, enforced by atropine and dark glasses, if necessary.

"The prognosis of uremic amaurosis as to sight is favorable for the first attack, and less and less so far each succeeding attack; but the importance of this is usually overshadowed by the uremic condition present.

"The prognosis of albuminuric retinitis as to sight is favorable for the first attack, if occurring after the sixth month, but grows worse if it recurs in succeeding pregnancies. Prognosis for sight is bad if it comes on earlier than the sixth month, especially if it begins during the first two months; and in these cases great danger to both child and mother may be expected from eclampsia.

"As to abortion or premature labor, we are seldom called upon to consider it for the preservation of sight alone, since so many and such grave dangers are present to both mother and child from uremia. If we consider the preservation of sight a cause for premature labor, then it may have to be done in uremic amaurosis recurring in successive pregnancies, with progressive loss of sight; the degree of impairment of sight and the amount of damage done to the optic nerve deciding the question.

"In retinitis albuminurica occurring early, abortion should be considered if the retinitis is of a severe type, especially if hemorrhagic, or if a slight retinitis progresses under treatment, remembering that in these cases the life of the child is uncertain anyway, and the mother runs grave risks of eclampsia if the pregnancy goes on to term. In retinitis coming on after the sixth month it is best to wait and watch carefully, especially in a first attack, and not to induce labor unless some other albuminuric symptom demands it. In subsequent attacks the damage to vision and the severity of the retinitis may turn the scale in favor of premature delivery, even when slight eclamptic symptoms are present."

Hysterical Disorders of the Eye.

PHILLIPS, FRANK A., Chicago. (*Amer. Journal Ophthalm.* Sept., 1901.) It is quite universally recognized that these disturbances are psychic in character, beginning in the higher cortical centers; the function of the lower centers of the brain, spinal cord and of the sympathetic nervous system becoming secondarily involved. The age at which hysteria manifests itself is, in half the cases, between ten and twenty.

Among the disturbances noted, the writer mentions (a) sight, (b) sensation, (c) motion, (d) secretion, and (e) peculiar associated sensations (*audition colorée*.)

“(a) Concerning sight disturbance we observe that *amaurosis* rarely attains total blindness, it being usually unilateral and accompanied by amblyopia, more or less marked in degree, of the fellow eye. This is explained by the theory of its being a “crossed amblyopia,” the affection involving the center of vision, higher than that for the half field vision, in which the entire field of the eye opposite the hemisphere is fully represented and that of the same side partially. This center is located in the lower and posterior part of the parietal lobe, the supra-marginal and angular convolutions” “*Amblyopia* is frequently bilateral, often affecting one eye to a more marked degree than its fellow. The visual field is concentrically contracted, the color fields, beside the contraction, often showing transposition or even a total color-blindness. the transferring of the affection from one side to the other by suggestion, using therefor a magnet or any object supposed to possess intrinsic power, may be demonstrated. The examination at short intervals shows marked changes in visual acuity and the field of vision. The suggestion that a plane glass will greatly improve vision is often acted upon immediately. Paraesthesia usually confined to one side, and that of the more affected eye, are frequently demonstrable. When, as frequently occurs, a suspicion of simulation is aroused by the patient's response in answer to confusion tests, these other symptoms of hysteria are of importance from a diagnostic stand-point. In traumatic hysteria, where a legal controversy for damages frequently exists, the difficulty is enhanced, but it is often present when absolutely no cause for simulation can be found.”

“*Asthenopia* is that type of case characterized by extreme tiring of the eyes with exaggeration of painful symptoms. Muscular, refractive, and all discoverable peripheral irritations being sought out and relieved, still these patients frequently continue to find cause for complaint in such symptoms as radiating eye pain or headache with an exhaustion of the retina, evidenced by blurring vision, following slight use of the eyes. Central vision is likely

to be found normal, but the concentric contraction of the visual field and color defects are generally present. After using the eyes vision will be found lowered. *Monocular diplopia* is unsatisfactorily explained by irregular ciliary contraction.....*Hemianopsia* purely functional in character is of rare occurrence. Hallucinations, astigmatism and scotomata are reported. These disorders of sight are of sudden inception, last indefinite periods, and generally disappear entirely, often suddenly. The fundus shows no changes from the normal. The functional loss may become permanent, but in what way the change in structure is brought about is unknown."

"(b) Disorders of sensation include paraesthesia of all degrees. Anesthesia or hyperesthesia of the cornea, conjunctiva, and integument of the lids and temple may be present singly or in a group. The anesthetic cornea, when imitated, may cause reflex injection of the anterior ciliary and conjunctival vessels and increased secretion of the tears; it is not involved in neuro-paralytic keratitis. In hyperesthesia the vision may be increased, but photophobia may be present and vision reduced."

"(c) Disorders of motion include both paralysis and spasm. Of paralysis of the *extrinsic* muscles mentioned in literature, I find only abducens paralysis and ptosis Spasmodic conditions more frequently prevail. Hysteric blepharospasm is most often bilateral. It appears suddenly and is as suddenly relieved, the attack lasting from hours to even months. Pressure points often exist, i. e., points usually in the territory supplied by the trigeminus, upon which pressure at once relieves the blepharospasm. When the lids are simply held quietly closed the resemblance to ptosis is marked, but is diagnosed by the presence of resistance to effort at lifting the lid, the lowering of the eyebrow and the vertical furrows produced by the orbicularis contraction. Both paresis and paralysis affect the *intrinsic* muscles. Charcot describes a "contracture" of the ciliary muscle in which the remote and near point became fixed at a certain distance from the eyes. This is distinguished from paresis by the absence of any range of accommodation. The dilator and sphincter iridis are affected, as evidenced by the pupil and its reactions."

"(d) Of the disorders of secretion, epiphora without a cause is of comparative common occurrence. Chromidrosis of the lids is quite as rare."

"(e) Of perversion of associated sensations, both *audition colorée* and "sounding vision" have been observed."

"As in affections of sight, these varied disturbances are usually found in connection with other hysterical symptoms, but may be the only symptoms present. Their diagnosis from beginning organic disease is not always easy or possible at first examination, but their anomalous course and distribution usually furnish unmistakable signs of their functional character. The prognosis is dependent upon the patient's age, antecedents, physical condition, the degree of hysteria manifested and the duration, and the presence of discoverable peripheral imitation."

Regarding treatment, the writer says that although the eye findings should be considered, the parents and family physician should be consulted before advice is given. The early management of such cases occurring in children means much as to whether they are to become self-reliant, useful individuals, or unhappy neurotics. Their trouble should neither be minimized nor exaggerated and the term "hysteria" should not be used in connection with the case—the word "reflex" will be better received. Hypnotism has been tried and recommended by others. "Suggestion therapeutics have been and will probably remain one of the great powers for good in these cases. An authoritative, positive opinion to follow a line of treatment means much to these patients. And the more the suggestion can be conveyed in the rules regulating their habits of work, study and play, the better. Placebos, such as plane spectacles, should be avoided, if possible. A placebo remedy may be necessary. It has been my experience to find in all cases of ocular hysteria a refractive error warranting correction; this should be corrected. A muscular defect, proven to be not functional, should be remedied, if of sufficient degree, by an appropriate operation. Faradism is, of course, to be tried in persistent affections, and is often very beneficial." Detailed histories of seven cases of this affection follow.

Hemorrhage Into the Vitreous.

RIDLEY, N. C., Leicester, Eng. (*Ophthalmic Review*,

Aug., 1901.) The writer, after discussing the anatomy and pathology of hemorrhage into the vitreous, offers the following as a classification:

- (1) Traumatic.
- (2) Due to general diseases such as anemia, diabetes, renal disease, and atheroma and other vascular degenerations.
- (3) Occurring in high myopia.
- (4) Occurring as a complication of glaucoma.

Traumatic may be either from ciliary or retinal vessels. In general diseases usually from retinal vessels but occasionally from ciliary. Myopic invariably from retinal. In vascular degeneration probably always retinal. As a complication of glaucoma generally ciliary.

Then having described the general appearance and symptoms, Ridley says that under favorable circumstances the hemorrhage will be absorbed, the blood being decomposed partly by solution in the watery part of the vitreous and partly by the action of the leucocytes and carried off in the lymph circulation through the spaces of Fontana.

"The treatment is pretty much the same in all, viz: rest, dark glasses, avoidance of exertion, sometimes keeping the patient in bed for a few weeks, weak atropine locally (except in those cases where glaucoma is present or threatening, in which one may be compelled to perform an iridectomy in spite of the specially unfavorable circumstances), and iodide of potassium internally."

The prognosis varies, the writer says, but generally speaking is more favorable than in any other form of intraocular hemorrhage. Some cases which appear to be absolutely hopeless recover in a marvelous manner, while in others the vision is permanently damaged though the hemorrhage may be absorbed. In these latter, however, in all possibility the hemorrhage has torn up the retina, or caused the usual results of prolonged ultra ocular pressure. Ridley closes his article by giving six illustrative cases from his recent case books.

A Brief Note On Aspergillus Keratitis.

BALL, JAMES M., St. Louis. (*American Medicine*, July 6, 1901.) Comparatively few cases of this affection have been observed and described. The writer refers to a number of such cases, described by another practitioner, and

gives the history of a similar case with a report of the microscopical examination of the aspergillus mass. He emphasises the following points:

1. Aspergillar keratitis is a more common disease than has been supposed by writers of ophthalmology;

2. Intense pain in the eyes, followed by the development of a brownish or black mass within the substance of the cornea are pathognomonic signs of aspergillus keratitis;

3. Removal of the mass early in the case is followed by uninterrupted cure;

4. Failure to recognize the condition and apply proper treatment is followed by sloughing of the cornea, and in some cases by loss of the eye;

5. In the few cases of keratomycosis aspergillina where cultures have been made, only *Aspergillus fumigatus* has been found (Schanz.)"

Chalazion.

HALE, ALBERT B., Chicago (*Ophthalmic Record*, Aug., 1901.) After giving a resumé of our present knowledge of chalazion the writer says: "Thus we see that the condition with which we deal is not simply a retention cyst but a true inflammatory product, with the associated but incidental accumulation of fluid, some of which is true glandular secretion, the rest indefinite product of the unhealthy cyst wall," and suggests the following as a definition: "Chalazion is a tumor in the lid involving the Meibomian gland, with obliteration of the glandular elements; it is limited by a surrounding membrane, within which are found the perverted secretion of the earlier gland, glandular debris, micro-organisms, and sometimes pus."

The writer believes that the general health has considerable influence in causing this condition, and that some disorder may produce a thickened secretion, wherupon the constant rubbing to which the lid is exposed, aided perhaps by incidental germ infection, starts the inflammation which leads to chalazion.

Concerning treatment, he states that in young children and sometimes in adults, where the tumor has appeared suddenly and is not hard or thoroughly circumscribed, absorption may take place either spontaneously or by the help of heat and gentle massage. When the tumor

has irritated or eroded the conjunctiva, and either softened or broken through this underlying tissue, it should be excised through the conjunctiva, followed by the curette. Where the conjunctiva and its adjacent tarsus are unaffected, but where the overlying tarsal wall is thinned, and the direction of least resistance thus made evident, the tumor should be excised through the skin; the incision can be made parallel with the free border of the lid, the orbicularis carefully pushed aside, and the tumor with its wall dissected from the tarsus; the skin incision is then closed by one or two stitches. Under such circumstances, excision through the skin is cleaner, more scientific, and no more painful than when removed through the conjunctiva; the tumor never returns, and no scar need result.

Concerning the Treatment of the Apparently Unaffected or at Most but Slightly Involved Eye in Cases of Glaucoma.

DESCHWEINITZ, G. E., Philadelphia (*Phila. Med. Journal*, Sept. 21, 1901.) After describing the different varieties of glaucoma, the writer propounds the following questions:

I. What shall be done with the apparently sound eye after the first eye has been operated upon for acute glaucoma? Are there any signs by which one may reasonably infer that the apparently sound eye will suffer an acute glaucomatous attack like its fellow eye, within a comparatively short time? The following have been suggested: (a) Shallowness of the interior chamber and beginning opacity in the lens with swelling and a high degree of hypermetropia, and smallness of the corneal diameter. (b) The mydriatic test. (c) The palpation test. (d) The history of prodromal glaucomatous phenomena. If these tests are positive the correct answer to the original question would seem to be: An iridectomy should be performed upon this eye as soon as the anterior chamber is restored on the opposite side.

II. What shall be done with the apparently sound eye after the first eye has been operated upon for chronic congestive glaucoma? "Why should one wait until the damage is done? Would it not be better to anticipate both the agglutination of the root of the iris to the cornea in a firm adhesion, and the destruction either of areas of ganglion cells of the retina, or of the optic nerve fibres, by making what Collins has termed a preventive iridectomy?"

III. What shall be done with the apparently sound eye after the first eye has been operated upon for simple chronic glaucoma? It is more difficult to answer this question but less frequently necessary, because so many of the cases are bilateral almost from the start. Less frequently this type is monolateral. Are there any signs by which one may reasonably infer that the sound eye will become involved? The following have been suggested: (a) Formation of a cup beginning to be pathological on the temporal side. (b) Periods of increased intra ocular tension. (c) Alterations in visual field. (d) DeWecker's sclerotomy test—if after anterior sclerotomy the symptoms are ameliorated, especially if the field enlarges, suspicion is confirmed.

"Absolute glaucoma may be a unilateral disease. Generally if one eye is blind from glaucoma of this type, the question when an operation shall be performed upon the opposite eye is answered with the statement: Not until there are some manifestations of glaucoma."

In conclusion, DeSchweinitz says: "I would make the following recommendations subject to alteration suggested by the discussion, which I trust will follow:

"(1) In cases of acute glaucoma the apparently unaffected eye should be operated upon as soon as the anterior chamber is restored in the opposite eye; that is to say, as soon as the wound is closed, provided the history of the case or an examination of the eye furnishes indications already described that it is likely to suffer a glaucomatous attack like its fellow, especially if the patient is so situated that he or she will pass from observation and from the resources of expert examination. (2) In cases of chronic congestive glaucoma the same line of advice applies, and the operation is to be urged if clear information can be obtained that the apparently unaffected eye has suffered attacks of nebulous or iridescent vision, associated with increased intraocular tension. (3) In cases of chronic simple glaucoma, if any periods, however temporary, of increased intraocular tension can be demonstrated according to the methods already suggested, operation should be performed even if central and peripheral vision are perfectly intact. Even when these are normal, careful perimetric examination may reveal a scotoma of the character

already described; if so, operation should not be postponed. (4) In cases of absolute glaucoma the same line of advice expressed under No. 1 and 2 is applicable."

Nerve Resection as Applied to the Supra-Orbital and Naso-Lacrimal Branches of the Fifth Pair.

STILLSON, J. O., Indianapolis, Ind. (*Amer. Journ., Ophthalm.*, Aug., 1901.) After stating that this procedure seems to have passed out of the minds of the present day operators, their attention being directed chiefly to the nasal vault in the majority of cases of orbital and supra-orbital neuralgia, the writer calls attention to a few points which seem to indicate that the resection of the supra and infra-orbital, and the ciliary connection between the fifth and the globe by the nasal branch, and the branch which supplies the tear gland, may, in suitable cases, yield results which justify us in selecting this simple, easy and almost harmless procedure under certain conditions.

Badal has called attention to the operation of elongation, or "arrachement" of the branch which he calls the external nasal, for the treatment of the following forms of "douleur" etiologically distinct: "First, those painful affections which are purely and simply the expression of a neuralgia of the trigeminal nerve, not accompanied by any appreciable pathological complication in the globe. Second, those which result from certain affections traceable to the tunics of the eye, in particular the ciliary region and the uveal tract, where we have hyperemia and engorgement, with compression on the filaments of the terminal branches of the nerves not distinctly necrotic or inflammatory in character, yet having a tendency to inhibit normal physiologic metabolism. Third, those painful phenomena which may be recognized as having an origin in some way connected with pressure on the ciliary nerves in the globe where the departure from normal intra-ocular tension is easily made out. Occasionally we note the increased depth of the anterior chamber. Later there may occur a primitive or secondary glaucomatous process arising as a factor or as a sequel to the above, and in many instances which of the two conditions is the true one we cannot always determine."

The writer gives the following directions for finding the main trunk of the nasal nerve near its bifurcation: "Place

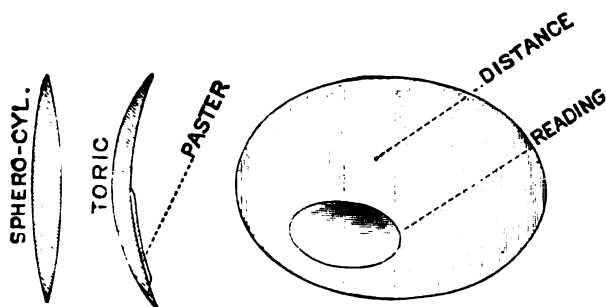
the index finger upon the globe immediately beneath the margin of the orbit, the palmar surface in front, and the extremity of the finger resting against the angle of the nose. The point of emergence of the nerve will be found to be located exactly beneath the center of the margin of the nail (Abadie). Describing the operation he says: The primary incision is to be made with a bistoury, and the dissection finished with blunt hooks or the back of the knife; usually a small plexus of vessels accompanies the nerve, which is to be separated and the nerve is to be drawn slowly from the orbit, tearing it away at as great a depth as possible so as to get out the deeper portion and sever the ethmoidal connection as well as the connection with the ganglion." In the case of the supra-orbital the writer usually simply cuts down on the notch and passes a strabismus hook under the orbital aspect and readily finds the nerve. When the notch is in the form of a foramen, he cuts out the anterior portion and liberates the nerve so as to get out quite a quantity from the corrugator, backward, and seizing the orbital trunk well in the orbit makes steady traction until the nerve stretches considerably, before finally breaking deep in the orbit; in this way about two inches can be successfully removed. The small wound is dressed antiseptically and closed with one or two small sutures, or may be sealed up with plaster. At the end of forty-eight hours there is primary union. The article closes with the citation of a number of cases in which this operation was successfully performed.

Bifocal Lenses; What Area Shall be Devoted to the Shorter Focus.

WEEKS, JOHN E., New York. (*Medical Record*, Aug. 24, 1901.) The writer discusses the difficulties to be overcome in prescribing glasses for hyperopic; he describes the various forms of bi-focal lenses and mentions their shortcomings. He describes the small oval disc which has been substituted for the crescent-shaped slip; this leaves the sides of the distance lens free, permitting of limited distance vision all around the portion used for reading (see Fig.). This is probably the best form, but the size of the disc must be carefully determined.

"Segments of circles ordinarily employed measure from 20 to 30 mm. in their horizontal diameters and 13 to 16 mm.

in their vertical diameters. Circular "pasters" usually measure 17 mm. in diameter. These "pasters" are placed so that they reach the lower edge of the distance lens. The horizontal extent of the field for reading that these "pasters" give is approximately 35 cm. (15 in.)—much too large. They cut off too much of the field of vision for distance in its lower part. If a smaller oval "paster" can be put on the distance lens so that it will give sufficient field area at the reading distance and will also permit a distance vision almost if not quite entirely around it, we shall then have a bifocal lens which will give maximum service with minimum discomfort. After some trials with various lenses and some experi-



Desirable Form of Bi-Focal Lens.

ments with various devices the writer has concluded that this can be obtained by the use of a "paster" of oval shape which measures 10 mm. in its vertical and 15 mm. in its horizontal diameter; this gives a field at the reading distance of approximately 19 cm. (7 in.) in the horizontal, and 12.5 (5 in.) in the vertical meridian. If the oval disc ("paster") is placed 2 mm. above the lower edge of the distance lens it will permit a clear distance vision below, sufficient to enable the wearer to see the curb, descend stairs, etc., without trouble; in fact, to be free from the great annoyance occasioned by the ordinary bifocal glasses. The "pasters" are placed a little to the inner side of the center of the distance lenses so that the visual lines in reading will cut the centers of the "pasters." It is sufficient to place the optical centers of the portion of the lens for reading at the center of the "paster." The dispersion rays of light occasioned by the edge of the

"paster" can be minimized by making the edge very thin. The writer has worn such glasses and finds them excellent for all purposes. In his operative work they are particularly serviceable. Patients also express themselves as being particularly pleased with this form of bifocal glasses."

The Amount of Myopia Corrected by Removal of the Crystalline Lens.

JACKSON, EDWARD, Denver, Colo. (*Journal Amer. Med. Assoc.*, March 16, 1901.) The writer points out what is our present knowledge of this subject and urges the reporting of more exact data regarding future cases, since, despite the hundreds of reported cases, great uncertainty still remains as to the exact optical effect produced by removing the clear lens from a highly myopic eye.

If high myopia were due solely to excessive curvature of the cornea, the removal of the lens would cause the same optical effect as in the emmetropic eye—about 11 D. as measured at the cornea or 12 to 13 D. as measured by a concave lens placed in the usual position for spectacle lenses. With myopia due solely to excessive refractive influence of the lens, the eye after removal of the lens would possess the same refraction as would a previously emmetropic eye after removal of the lens—that is hyperopia of 11 D. measured at the cornea requiring for its correction a convex 10 D. lens placed in the usual position. When myopia is due to increased length of the antero-posterior axis of the eyeball the optical effect of removal of the lens increases directly with increase of the axis; the higher the myopia the greater the effect of removal of the lens.

Different writers are widely at variance as to the amount of myopia that should be just corrected by removal of the lens, as to the previous refraction of the eye which when rendered aphakic will become emmetropic. Jackson's approximate estimate was 18 D.; Hirschberg's, 21 D.; Otto's 20 D.; Percival's 26 D.

Contrasting the theoretic possibilities of the case the writer says: "The myopia of an eye that will be rendered emmetropic by removal of the lens will be: for myopia due to corneal curvature, 13 D.; for axial myopia, 26 D.; for lens myopia of any amount the eye will never be left emmetropic, but will be made hyperopic, 10 D."

Jackson next takes up the reported effects of removal of the lens in actual cases and states that the majority of these reports show, upon the very face, that they are loose and inaccurate. Still, he considers it worth while to compare these recorded results with those of theoretical investigation. He tabulates the recorded results of 296 cases giving D. of myopia before operation, theoretical change to be expected for axial myopia, average change observed, maximum and minimum change reported, and the number of cases of each degree of myopia included.

From this table he concludes "that for a given amount of myopia the effect of removal of the lens may vary 10 D. or more. Such a variation is too common to be explained as mere inaccuracy of observation. While the general trend of the figures indicate that a lengthened antero-posterior axis is the most important cause of very high myopia, lens refraction, or both, are factors of practical importance. We never can predict with exactness the effect of an operation until these are taken into account."

Calculations based on the Helmholtz values of the schematic eye indicate that 25-26 D. of axial myopia should be corrected by removal of the lens; reported cases indicate about 20 D. Either the high myopias are usually partly curvature myopias, or some of the values assigned to the schematic eye are at fault. After lens extraction, the corneal curves continue to change for several weeks or months, but after six months the change is slight, and after one year is rarely of importance. After lens extraction there is for a time a bulging of the cornea causing temporary increase in the antero-posterior axis of the eyeball. This gradually diminishes with corresponding diminution in the refraction of the eye.

In conclusion, the writer urges: "Both for the good of the individual patient, and for the advancement of our knowledge of the refraction of the eye, and of this operation, the more complete and exact study of the ocular refraction and the curvature of the cornea, both before and after the removal of the crystalline lens for high myopia.

The Use of Cuprol in Granular Ophthalmia.

SNELL, SIMEON, Sheffield. (*The Lancet*, Sept., 14, 1901.) "The number of remedies proposed and used at

one time or another for the treatment of granular ophthalmia is multitudinous. The old-fashioned "blue-stone" nevertheless still occupies a prominent place among the more reliable local applications and the benefit in many cases from its use is unquestioned. Recently in some cases I have substituted for the copper sulphate a new chemical compound of copper called cuprol. It is a form of copper in combination with nucleinic acid and is said to contain 6 per cent. of copper. It is claimed for it that it penetrates the tissues more deeply and is much less irritating to inflamed surfaces than the ordinary copper salts. It does not coagulate albumin nor is it precipitated by alkalies and it is readily soluble in warm water. I have employed cuprol in several cases of trachoma. Many have been more or less chronic but a few have been more acute. In some also there has been pannus.

Cuprol is supplied in the form of a fine impalpable powder and the application has been made by freely dusting the powder on the inner surfaces of the lids which were everted for the purpose. A convenient way is to take the powder up with a camel-hair brush and to dust it on the eyelids or to spread it about with the brush. The powder is so impalpable that it does not immediately irritate and the discomfort occasioned afterward is very slight compared to that caused by the application of "blue stone." A lady, a sister of mercy, long accustomed to having "bluestone" applied to her granular lids, is very decided in her preference for the cuprol in consequence of the less discomfort it causes. Others have made the same statement. The patients at the infirmary have testified to this in a practical manner by quickly departing after the application, whereas if copper sulphate had been employed they would have wanted to wait about until the effects of it had somewhat subsided and this even when cocaine had been used. With cuprol the use of cocaine has not appeared to be necessary.

The applications of cuprol have, in some cases, been made daily; in others twice a week or less frequently. In the interval a 5 per cent. solution of cuprol has, in a few cases, been prescribed to be dropped into the eye. Up to the present the use of cuprol as an alternative to other

remedies is distinctly encouraging. I propose to use it in solution in other conjunctival affections.

The Use of Sulphate of Copper In Affections of the Cornea and In Affections of the Lid Other than Trachoma.

CLAIBORNE, J. H. New York. (*Medical Record*, July 27, 1901.) The writer presents the results of his experience in the use of the solid stick of sulphate of copper in the affections indicated in the title. He cites the histories of a number of cases to illustrate the favorable results obtained and sums up his conclusions as follows: "Copper sulphate in the form of the solid stick is indicated: 1, in all acute attacks of inflammation of the cornea in which there is thickening with a succulent, velvety appearance of the upper lid; 2, in all recurrent attacks of superficial keratitis in which the same condition of the upper lid prevails; 3, in infiltrations of the cornea which are the result of preceding inflammations, associated with the same condition of the upper lid; 4, in maculae of the cornea in children and adults which have occurred at reasonable time after an inflammation, whether the upper lid presents the characteristic appearance or not; 5, in chronic conjunctivitis attended with thickening of the upper lid associated with blepharitis; 6, in chronic dacriocystitis (particularly in these cases in which the canaliculus has been slit) attended by chronic conjunctivitis."

The Disadvantages of Copper Sulphate In Diseases of the Conjunctiva and Cornea.

WILLIAMS, CORNELIUS, St. Paul, Minn., (*Medical Record*, Sept. 21, 1901.) The writer refers to the routine use of this remedy for every disease of the conjunctiva in which there is infiltration or hyperplasia; although admitting that the results might be good in the hands of the careful and skilful, he claims that its abuse by the many has become the rule. "The objections to the use of copper sulphate are so great, and its advantages so much less than those of other and safer remedies, that I think it should be banished absolutely from our list of remedies. There is nothing which it can accomplish which may not be done with infinitely less pain, and in a much shorter time, by other means. Mercury bichloride, for example, is so far superior to copper sulphate in trachoma, or in any chronic pernicious hyperplastic condition of the conjunctiva, that

there can be no comparison between the two. The copper salt is painful, and the pain is long and will not quiet; the mercury solution, properly used, is painless and efficient. For all of those conditions enumerated by Dr. Claiborne (see preceding abstract) the mercury salt is pre-eminently adapted. Those who may not have used bichloride of mercury in trachoma, but who have had an extensive experience with copper sulphate, if they can be persuaded to substitute the mercury salt for the copper, will never, under any circumstances, return to the barbarity of copper in the solid salt."

The writer gives a number of illustrations of the damage caused by bluestone in trachomatous eyes. For velvety conjunctivae he recommends cleanliness and nitrate of silver always with boric acid, sometimes with glycerin and alcohol also. He never uses strong solutions and thinks they are contraindicated. "For trachoma, with or without expression, I use a solution of silver nitrate of one-tenth to one-fifth of a grain as often as in my judgment that particular case may require. The eye is irrigated very freely from six to eight times a day with bichloride (in salt solution), 1 : 40,000. Before applying the silver solution, and before irrigation, the conjunctival sac should be thoroughly cleansed by wiping with absorbent cotton; the toilet is completed by carefully wiping dry the edges of the lids; this removes moisture and decomposing particles which induce itching, rubbing, and consequent increased inflow of blood."

The writer believes the most difficult part of the treatment of trachoma is the finishing and for this he recommends a solution of tannic acid and boric acid in glycerin and water. When he wishes to stimulate the cornea to increased tissue change, he adds alcohol. He has not seen staining of the conjunctiva occur from the use of the weak silver solution, even when its application has been kept up for a long time. He sums up his conclusions as follows:

1. Copper sulphate in ocular affections is maleficent in its effects.
2. Any good effect following the application of the solid copper sulphate in any disease of the eye may be obtained with the use of safer and practically painless means.
3. Trachoma is most successfully treated with weak solutions of silver nitrate, together with frequent

irrigation with weak bichloride solution in normal salt. 4. No application to an inflamed conjunctiva which produces a lasting pain should be countenanced. 5. Expression is not absolutely essential, yet much hastens the cure of trachoma. 6. A mydriatic should be used in every disease of the eye involving corneal lesions. 7. Copper has ruined more eyes than it has ever benefited."

The Therapeutic Value of Adrenalin Chloride.

REYNOLDS, DUDLEY S., Louisville. (*American Medicine*, July 6, 1901.) The writer presents his personal experiences with adrenalin, his favorable opinions being based upon 1222 experiments conducted at his clinic. Some of these observations in individual cases are given in full. The paper closes with the following summary of the effects of this remedy :

"1. It is a powerful hemostatic, and acts promptly, generally within one minute from the time it is applied locally to mucous surfaces.

2. Its effects persist from 20 minutes to 4 hours.

3. It promptly relieves ciliary pain in all forms of keratitis, iritis, and even the cyclitis of glaucoma.

4. It reduces ocular tension in glaucoma, and apparently prevents hemorrhage in iridectomy.

5. It promptly clears up interstitial opacities of the cornea, following contusions, and seems to modify favorably the opacities of punctate keratitis in cases of syphilitic iritis.

6. It will, in many cases, so reduce the swelling in the tear passage as to allow a stream of fluid to pass from Anel's syringe through the duct, without the use of a probe. In an old purulent dacryocystitis, the pus being pressed out with the finger through the tear sac, about 2 minims of adrenalin was passed in with the Anel syringe. Five minutes later, a charge of sodium chlorid solution passed readily through the duct into the nose. Repeating this procedure daily, prompt recovery was secured without the introduction of the probe. In a great variety of tinnitus aurium, prompt and sometimes lasting benefit follows the introduction of a drop of adrenalin solution through the eustachian catheter, blown into the tympanic cavity. A number of cases of tinnitus without serious impairment of

hearing, have been permanently relieved by 2 or 3 applications of the adrenalin through the catheter.

7. In all forms of swelling in the lining of the nose, prompt relief follows the applications of 4 or 5 minims of the adrenalin solution sprayed into the passage. In this way the superior crypts may readily be opened, and medicated fluids sprayed into the passage, or other applications made, where access is otherwise impossible. It renders operations in the nasal passages, and elsewhere, nearly or quite bloodless, and does not, as some claim, predispose to secondary hemorrhage, but has a contrary effect. The 1 to 1,000 solution of adrenalin in sodium chlorid may be relied upon and to relieve any case of epistaxis. In cases of secondary hemorrhage, after operations in the nasal cavities, or tonsils, an application of adrenalin solution on a cotton mop, pressed upon the bleeding surface, proves promptly efficient as an hemostatic.

The adrenalin solutions are in every sense of the word, superior to any preparation of the suprarenal extract, or of the dessicated glands which I have been able to procure."

A Note on Holocain.

CRAWLEY, FRANK C., Dublin. (*The Ophthalmic Review*, Sept., 1901.) The writer describes his experience in the use of a 20 per cent. solution of holocain (originally a 1 per cent. solution, probably strengthened by evaporation) for the removal of a foreign body on the cornea. No untoward symptoms followed its use, but it produces a transient mydriasis beginning fifteen to twenty minutes after instillation and lasting two or three hours. This, Crawley says, would seem to show that a 20 per cent. solution of holocain can be freely dropped into the conjunctival sac without danger, although, of course, it has no advantage over a 1 per cent. solution.

ABSTRACTS FROM ENGLISH COLONIAL OPH-
THALMIC LITERATURE,

BY

FRANK ALLPORT, M. D.,

CHICAGO, ILL.

(Quarter ending September 30, 1901.)

Extract of Cataract in Capsule.

SMITH, HENRY, M.D. (*Ind. Med. Gazette.*) In over 3000 cases in 2 years the results were as follows:

First class, 96.05 per cent.; second class, 2.3 per cent.; failures, 1.05 per cent.

In first class were included all cases with clear vision with aid of lenses (usually 11, 12 or 13 D); in second class, vision not clear with lenses but enough to get about with; failures, those gone wrong from any cause. Dr. Smith's paper is a plea for extraction in the capsule. He believes that it is as simple as any other extraction, that it leaves nothing behind to become opaque. It requires no after operation to remove an opaque capsule, it gives clearer vision than when capsule is left behind, it leaves no foreign matter to set up iritis, no instruments need to be inserted into the eye to remove lens matter. There is a minimum of manipulation and therefore a minimum of injury to epithelium of cornea. The disadvantage is that there is a little greater liability to escape of vitreous.

Cataract and Its Extraction in the Government Ophthalmic Hospital, Madras.

POPE, T. H., M.D. (*Ind. Med. Gazette.*) Dr. Pope draws conclusions from the enormous experience of over 5000 operations during the years 1896 to 1900.

He uses the usual preliminary antiseptic precautions and practices the method of extraction without iridectomy, making the corneal cut 2 mm. above the horizontal diameter, including a conjunctival flap in its completion. He believes the two great advantages to be, that prolapse of

the iris seldom occurs and that the lens cortex is much more easily removed from the eye.

Among accidents, he has met with secondary glaucoma but not often. It has followed operations with and without iridectomy and in cases of prolapse of the iris when an iridectomy has been performed at the time of the extraction or a prolapse has occurred and been excised; secondary glaucoma when it occurs is due to the incarceration of the iris in the cicatrix of the cornea and sclera and also to the local adhesions of the iris to the posterior surface of the cornea.

In incarceration of the iris he performs an iridectomy (sometimes the second on the same eye) well to the margin in a downward and inward direction.

If occlusion of the pupil occur following iritis or irido-cyclitis an iridectomy is performed after all inflammation has subsided. In this condition the prognosis is always bad and the operation frequently a failure.

Cataract Extraction at the C. J. Ophthalmic Hospital, Bombay

HERBERT, H., M.D. In 497 operations a 1 to 3000 sublimated solution was freely used and the entire series was completely exempt from grave infection. In a second series in which the same fluid was less freely applied there were 3 severe primary infections; a third series of 349 cases where the quantity and strength of solution were less panophthalmitis occurred 3 times and there were 7 cases of iritis and irido-cyclitis.

Irrigation of the anterior chamber with sterile normal salt solution is practiced in most of the operations. It washes away the blood from the conjunctival flap and is the readiest and most effective means of removing cortex; an ordinary laboratory wash bottle is used.

Eserine is used immediately after the operation in simple extraction if the pupil does not contract readily. Extraction in capsule is used for over-ripe cataracts in which the capsule is opaque and tough.

A Note on Cataract Operation and After Treatment.

LEWTAS, J., M.D. (*Ind. Med. Gazette.*) The operation practiced at Calcutta Eye Infirmary is that by means of a corneal flap. The addition of a conjunctival flap has

been abandoned because it causes a slight hemorrhage and a feeling of discomfort beneath the lid and it does not appear to offer any compensating advantages.

Dr. Lewtas performs an iridectomy if the iris interferes with the removal of the lens or subsequent clearing of the pupil from cortical substance which may have been detached. In 147 cases in 3 months an iridectomy was performed in 33. Secondary cataract does not more frequently occur without than with iridectomy. When it does occur a small opening is made with a keratome in the original operation wound and the secondary cataract withdrawn by means of iris forceps.

Immature cataracts are removed when patients are unable to wait for maturation and the results are satisfactory.

Some Practical Points in Cataract Extraction.

WANLESS, W. J., M.D. (*Ind. Med. Gazette.*) Dr. Wanless makes no previous use of a mydriatic and uses 4 per cent. cocain at the time of the operation, one drop every minute until 4 are used. The patients are operated upon the day they enter the hospital. He makes incisions in sclero-corneal limbus and makes a conjunctival flap of about 2 lines in width.

The lens is removed in its capsule without an iridectomy. This effects a more smooth healing and a better visual result.

The conjunctival flap secures prompt healing and there is less astigmatism following.

The most frequent accident is rupture of the capsule just as the lens is about to escape through the wound. In semi-fluid cataracts this is more apt to happen. It is, however, easy to grasp the remaining capsule with iris forceps and deliver it with pieces of cortex which may remain. If vitreous escapes iritis is likely, in this accident too much manipulation is to be deprecated; if the capsule is not easily caught he does an iridectomy and leaves the rest to nature. After operation if an iridectomy has been done the author uses a 1 per cent. solution of atropin; if a simple extraction he uses eserine.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ROBERT L. RANDOLPH, M. D.,

BALTIMORE, MD.

AND

CHARLES ZIMMERMANN, M. D.,

MILWAUKEE, WIS.

(Quarter ending September 30th, 1901.)

Cases of Sympathetic Ophthalmia.

ALBERTE, A., M. D., Heidelberg. (*Beitraege zur Augenheilk.* Heft 47.) A. reports in detail 14 cases of sympathetic ophthalmia, observed at the University clinic of Heidelberg, among 9,132 eye-patients (from January 1, 1890 until May 31, 1900), and followed up further with regard to terminations. Of 11 florid cases 5 showed plastic iridocyclitis, with 3 cases in the terminal stage, and 6 serous or sero-plastic irido-cyclitis. In one of the former an increase of refraction by 7 to 8 D'. was observed, apparently caused by stretching of the globe from increased tension, which, as it happened in the juvenile globe, apparently averted fulminant glaucoma. The precipitates on the posterior surface of the cornea are, according to Leber, due to the altered and roughened endothelium, while the anterior capsule which has no endothelium remains smooth and therefore free from deposits. They occur only on the latter if pupillary exudations exist. If Biehler's observation of the staining of the corneal endothelium with fluorescein should prove a reliable reaction in incipient sympathetic ophthalmia it would be a most valuable aid to an early diagnosis. Enucleation in such cases (if not malignant) is of benefit. Energetic treatment is undoubtedly of value. At the clinic of Heidelberg it consists of inunc-

tions of mercurial ointment, iodide of potash, diaphoresis, salicylate of sodium, atropine. Eserine (if increase of tension) is to be dreaded, even in iritis. Warm applications. The patients ought to remain in the clinic as long as possible, in order to meet relapses properly. Still the chief stress must be laid on prophylaxis.

Tumors of the Caruncula Lacrimalis.

BERL, VICTOR, M. D., Vienna. (*ibidem.*) Congenital tumors of the caruncle are extremely rare. B. observed 1st, a congenital dermoid cyst in a man, aged 47, horizontal diameter 10 mm. sagittal 9 mm. vertical still smaller. It is free except at the medial canthus to the nasal side of the upper tear point. Removed under cocain anesthesia. It contained hair follicles, stratified, and horny epithelium, and fragments of hairs. 2nd, Pedunculated angioma myxomatodes, 13 mm. diameter, grayish red, uneven, soft, at the right medial canthus of a patient aged 18. The peduncle arises from the caruncle and adheres to the innermost margin of the upper lid. The upper tear point is free and lies on the lateral side of the tumor which contains a great number of blood vessels, tough, fibrous tissue and myxomatous degeneration of interstitial tissue. The peduncle consists of elastic fibres, in which large afferent vessels are imbedded. 3rd, Melanosarcoma of the caruncle and the medial half of the ocular conjunctiva in a man, aged 72. The tumor reached 1.50 cm. into the depth, but did not involve the globe or the bone. Resection of the inner half of both lids and removal of the enlarged preauricular gland which was melanotic. 12 days after the operation excision of a submaxillary gland. The microscopic examination revealed a mixed cellular sarcoma with abundant pigment and debris in the centre, few giant cells and blood vessels. The pigment consisted of very fine granules and filled almost entirely the polygonal marginal cells. Caruncle and semilunar fold were replaced by neoplastic tissue.

Spontaneous Rupture of the Capsule and Spontaneous Delivery of the Nucleus of the Lens From the Eye.

MELLER, J., M. D., Vienna. (*ibidem.*) Histologic examination of 2 cases of spontaneous delivery of the nucleus of the lens which occurred 27 and 30 days after iridectomy for glaucoma. M. considers as the cause of this a profuse

retrochoroidal hemorrhage which separated the chorioid from the sclerotic and pushed it forward with the contents of the globe. Thus 1st, the wound gaped, 2nd, the lens capsule tore with prolapse of lens substance and 3rd, the hyaloid membrane ruptured with loss of vitreous. Then the nucleus of the lens escaped and was found subconjunctivally under the upper lid. The whole process is caused by opening of the eye-ball with continuation of intraocular pressure, as M. found by experiments on pigs' eyes. The equator of the lens is pushed into the wound by the resistance of the cornea, and, if the tension increases a little more, the capsule ruptures at the exposed equator. The ruptures of the capsule during the performance of iridectomy in glaucoma with subsequent cataract generally occur at the equator and are not the fault of the operator but spontaneous from increased pressure by retrochoroidal hemorrhages.

Four Interesting Ophthalmoscopic Cases.

RETZE, W., M. D., Greifswald. (*with a colored plate, ibid.*)

I. Central circumscribed sclerosis of the choiroidal vessels and atrophy of the pigment epithelium of both eyes in a man, aged 66, apparently a senile alteration, V = fingers at 3 m., excentrically. 2 cases of retinitis circinata. The white foci probably developed from hemorrhages as supposed by Ammann and observed by deWecker. IV. Congenital absence of the optic disc in the right eye of a girl aged 4 years. R. explains this either by too early closure of the cleft of the optic stalk or, with von Hippel, that the optic stalk was not invaginated, so that the mesoderma could not enter the optic stalk and thus the central vessels could not be formed. From the same reasons the optic fibres could not develop from the ganglion cells of the retina in centripetal direction.

Tearing Off of the Retina From the Ora Serrata.

VOSSIUS, A. PROF., Giessen. (*ibidem.*) 2 cases of tearing of the retina from the ora serrata with total detachment of the retina, caused by very severe injuries, one with, the other without, perforation of the eyeball.

Tearing Off of the Retina From the Ora Serrata.

DEUTSCHMANN, R., PROF. (*ibidem.*) In quoting his observations, published in Heft 40, D. again calls attention

to this interesting phenomenon which may be seen quite frequently in idiopathic detachment of the retina.

Results of Iridectomy in Primary Glaucoma.

VETTINGER, C. (*Inaug. Dissert. from the clinic of Prof. Mellinger, Basel, 1901.*) 23 cases of acute, 28 cases of chronic and 24 of simple glaucoma are reported in tabular form. Iridectomy had a beneficial influence in 95.65 0/0, of the acute glaucoma 76.15 0/0 of the chronic form and 15.81 0/0, of the simple glaucoma a bad one in 19.85 0/0 of chronic g. and 7.27 0/0 of simple g. V was improved in 73.91 0/0 acute g., 39.28 0/0 chronic g., remained the same in 4.34 0/0 acute, 14.29 0/0 chronic, 25 0/0 simple g., impaired in 21.74 0/0, 35.71 0/0, 66.66 0/0 acute, chronic and simple respectively failed in 10.71 0/0 chronic, 8.33 0/0 simple g. V. concludes that iridectomy influences the morbid process favorably in all 3 forms of glaucoma. The results are better the earlier iridectomy is performed.

On the Senile Affection of the Macula and Its Frequency.

SCHINDLER, J. (*Inaug. Diss. from the eye clinic of Prof. O. Haab, Zürich, 1901.*) The senile alteration of the macula, first described by Haab, generally bilateral, is limited to the fovea and its immediate surroundings, is slight and therefore difficult to see, but V is very much impaired, and the prognosis very unfavorable. It is often found in cases of amblyopia without ophthalmoscopic changes in old people. The pigment epithelium, the rods and cones are probably the primary seat of the disease, due to lack of nutrition from arterio-sclerosis. S. found out of 49,287 reports of the clinic (from 1896-1901) among 2373 patients from 60 to 70 years of age 43 cases, (1.81 0/0) and senile macular changes, among 883 from 70 to 80 years 46 cases (5.2 0/0) and among 77 over 80 years 6 cases (7.79 0/0), i. e. it is a rare affection. 3 types were predominant, although different stages of the same affection. Simple changes of pigment in 23 cases, mottled appearance in 38, marked patches, from secondary affections of the choroid in the later stages, 34 cases.

On Intraocular Iodoform-Disinfection According to Prof. Haab.

KNUR, KAROLINA. (*Inaug. Diss. from the clinic of Prof. Haab, Zürich, 1901.*) All 23 cases, so far treated by this

method, at the clinic of Prof. Haab are published in detail, under the following headings: Foreign bodies within the eyeball (fragments of hoes, of other forms of iron, copper and stone), perforations and postoperative infections, with a case of hypopyon-keratitis. Iodoform is remarkably well tolerated by the eyeball. In some cases opacities of the cornea were observed after introducing iodoform into the anterior chamber, probably from lesions of the endothelium. Therefore it is advisable to bring the iodoform into the anterior chamber outside the pupillary area. It is very difficult to express from this material in exact figures the value of the method. The results, i. e., useful eyes, were good in 10 cases, medium or relative in 5 cases, in which a quiet and usefully looking, but blind, eye remained, and 8 cases in which panophthalmitis and enucleation followed. The introduction of iodoform into the vitreous as pointed out by Haab may insure a more intense action.

Endarteritis of the Central Retinal Artery with Formation of Concrements.

GALINOWSKY, ZINAIDA. (*Inaug. Diss. from the clinic of Prof. Haab, Zürich, 1901.*) A woman, aged 74, became blind under the symptoms of embolism of the central retinal artery with subsequent inflammatory glaucoma, which did not yield to sclerotomy and miotics so that the eye had to be enucleated. The microscopic examination revealed obstruction of the central artery through endarteritis proliferans with formation of a concretum, probably of lime, within the proliferation outside the lumen of the vessel. The clinical diagnosis of embolism of the central retinal artery cannot be made from the ophthalmoscopic picture alone, but the general condition, especially that of the heart, has to be duly considered. In this case the local affection of the central artery could be inferred from the rigidity of the arteries accessible to palpation and from former apoplectic insults. The condition is illustrated by drawings.

Hyaline Degeneration of the Cornea.

SACHSALBER, A., M. D., Graz. (*Beitr. zur Aug. Heft 48.*) S. reports 5 cases and his histological examinations, illustrated by drawings, with the following results: Besides ordinary degeneration of the epithelium in corneal staphyloma a very frequent and characteristic form is the spread-

ing of cornified cells into the depth. Formation of hyaline and calcareous concretions in the corneal stroma and cicatricial tissue, which enter secondarily the epithelium. No colloid nor amyloid reaction is ever observed. Also a primary calcareous infiltration may occur. Large quantities of elastic fibres develop in sclera, episclera, conjunctiva and the marginal portions of the cornea which finally degenerate into hyaline. Degeneration of the iris occurs in form of hyaline concretions in the reticular and muscular strata, which also become gradually calcified.

Congenital Enophthalmus.

BERGMEISTER, R., M. D., Vienna. (*ibidem* Heft 48.) A case of congenital enophthalmus, asymmetry of the face is described from the clinic of Prof. Fuchs. The entrance of orbit 31 mm. (the other side 38 mm.) high, 33 mm. wide (37 mm.). Horizontal diameter of cornea 10.5 mm (the other 11.5 mm.) V. fingers at 3/4 m. V. F. normal. Coloboma of choroid and disc. Electric irritability of facial muscles normal. Ptosis from the retraction of the globe. Motility of eyeball very much impaired. Tentomy of the 4 recti muscles did not change the enophthalmus, apparently owing to the same condition of the obliqui, as was observed during the operation on the recti. No muscular insertion could be felt with the squint hook, only hard tendinous non-elastic bands. B. assumes that congenital enophthalmus is caused by embryonic changes independent of the congenital anomalies. Two other cases are briefly reported.

On Quinine-Amaurosis.

NOHL, E., M. D., Darmstadt. (*ibidem*.) Chronic intoxication with quinine in a man who suffered from malaria. V R fingers at 3 m. VL at 1 m. V. F. concentrically contracted. Diminished reaction of pupils. R. disc pale, with marked scleral ring, arteries narrow, veins normal. L. Disc perfectly white, rather polygonal than round, arteries contracted one-third, veins normal. Under roborating diet and injections of strychnia after two months V, R = 6/36 L. fingers at 1 to 1.5 m. The characteristics of quinine amaurosis are described in detail with a review of literature.

A Case of Primary Syphilitic Affection of the Lacrimal Gland.

ANARGYROS E., M. D. (*ibidem*, from the clinic of Prof.

Fuchs.) Foerster, in the first edition of Graefe-Saemisch, asserted that the lacrimal gland was the only organ of the eye which is not attacked by syphilis. Since then a few cases of gumma and syphilitic inflammations of the gland were described, but not a primary one as this, in a boy of 14. The upper lid red, swollen, edematous, livid. A sharply defined, hard, smooth tumor is felt above the tarsus, its posterior surface 1.5 cm. long 1 cm. wide. Conjunctiva is the seat of yellowish gray nodules of the size of the head of a pin, forming irregular patches by confluence. V. Normal. Swelling of pre-auricular and submaxillary glands. Apex of left lung gives dull sound on percussion. Diagnosis: Tuberculosis of the lower lacrimal gland, which is removed, also the pre-auricular and submaxillary glands. The wound healed per primam. After four weeks papulomaculous exanthema and general swelling of the lymphatic glands occurred and a week later syphilitic periostitis. Healed under antisiphilitic treatment. After two months swelling of several lymphatic glands and papules at anus. The microscopic examination of the tumor revealed no tuberculosis, but proliferation of tissue which was considered syphilitic. The infection started either from the conjunctiva or directly in the lacrimal gland through the secretory ducts without creating sclerosis of the conjunctiva.

Acetate of Beta-Eucain.

COHN, PAUL. (*Medicinische Wochens.*, Sept. 9, 1901.) He reports his observations with a 2 per cent. solution of beta-eucain on 20 normal and 80 diseased eyes from the polyclinic of Prof. Silex at Berlin. The acetate has the same anesthetic power as the muriate of beta-eucain and cocain. No toxic influence, no alteration of accommodation, mydriasis or change of tension were observed. It causes slight burning and hyperemia. Therefore it is to be avoided in hyperemic conditions. Beta-eucain is not decomposed by boiling and is cheaper than cocain. Muriate and acetate of beta-eucain are good local anesthetics which in many cases, especially in minor ophthalmic surgery, will probably replace cocain.

A Case of Cataract due to Malaria.

INOUE, M. D., Japan. (*Die Ophthalmologische Klinik*, 5 Juni, 1901.) It seems that Bagot is the only one who has

up to this time reported a case of so called malarial cataract. His communication contains reports of two cases, both in children. Inouye's case is as follows: The patient was a man twenty-five years old who had long suffered with malaria. The attacks were often so severe that he lost consciousness and he had noticed for some time past that his right pupil had been getting gray. When first seen he could make out the movements of the hand close by. The vision in the other eye was normal. The lens showed a homogeneous clouding. The urine contained neither sugar nor albumen. Extraction was performed but only partial success followed. Inouye thinks that the cataract was secondary to a sluggish uveitis and this was borne out by the fact that there was a small pupillary deposit in the left eye.

The Removal of Cataract and Cure of Detachment of the Retina in an Individual Who had Congenital Irideremia.

KÖNIGSHOFER, PROF. (*Die Ophthalmologische Klinik*, 5 September, 1901.) The patient was a man of thirty-three with very nearly complete irideremia. The border of the lens could be readily seen all the way around. The cortical substance showed a number of fine striations more marked at the posterior pole. This was the case in both eyes though it was more marked in the left eye. Some months after this he presented himself with the history that his sight in the left eye had gone very suddenly. Examination showed complete clouding of the lens and more or less swelling of the latter and the capsule showed a well marked vertical rent. There was no explanation of the capsular rent. The cataract was successfully extracted and good vision obtained. Three years later discission was performed and he was lost sight of for eight years at which time an examination of the left eye showed detachment of the retina. The patient was put to bed, compress bandage applied and he was sweated and later subconjunctival injections of salt (2 per cent.—8 per cent.) were tried. This was kept up for four months when it was seen that the retina had completely attached itself and this condition has remained for the past eight months.

Injury of the Eye Caused by Oil of Mustard.

NEUSTATTER, M. D., Munich. (*Centralblatt für praktische Augenheilk.*, Juli, 1901.) The patient was a druggist who

in trying to remove a flask of oil of mustard from a high shelf upset the fluid into his face. When Neustätter saw him his mouth and nose were full of mucus and the pain was maddening. The fumes of the drug were so strong in the room that it was almost impossible to keep the eyes open. The lids were enormously swollen and very red but with the exception of a small area in the conjunctiva there was only a moderate degree of chemosis. The eye which was untouched was congested from the fumes of the vapor of the mustard. The sight was apparently unimpaired. The eye was irrigated with a one per cent. solution of carbonate of potash and then a little oil and cocain (5 per cent.) salve was stroked upon the lids. Ice applications were also applied. Six hours later the lids were more swollen and there was some visual disturbance due in all probability to strings of mucus across the cornea. Eight hours later the patient complained of seeing everything cloudy. The lid edema persisted and the pain was very intense. Hot applications were then applied as being peculiarly suitable for the edema. This was kept up for twelve hours with the effect of reducing the pain and the edema. When the lids were well opened it was possible to see that there was a slight clouding of the cornea which explained the dimness of sight. The next day the clouding was still more marked but from this time on the vision began to improve and in a few days the vision had returned to normal and the cornea was bright and clear with only slight pericorneal injection. Neustatter thinks that the clouding was due to some interference with the nutrition of the tissues as a result of a specific action of the oil of mustard on the nerves. It acts as is supposed in a reflex way upon the nerve endings for which it seems to possess considerable affinity. The nerve elements then were directly injured and secondarily we had the tissue changes. It looked as though there were a subepithelial edema.

Melano-Sarcoma of the Choroid in Association with some Rather Remarkable Peculiarities.

HIRSCHBURG, J., M. D. (*Centralblatt für praktische Augenheilkunde*, August, 1901.) The patient was a man of fifty-five whose left eye had been rendered practically useless by an inflammation eight years previously. The right

eye was in a good condition but for a few days he had been complaining of bad vision in that eye. Examination showed melano-sarcoma. The man belonged to a family in which cancer was rather common and he was willing to have the eye removed but Hirschberg gave him iodide of potash and tattooed the corneal scar on the left eye and performed an iridectomy on this eye and began to give it systematic exercises in seeing while the other eye was bandaged. The improvement in vision was astonishing; $1/8$ from $1/20$ in a short time. About two months after this it became evident that the tumor in the other eye was progressing so the eye was removed and it proved to be a melano-sarcoma the size of a hazelnut.

A Case of So-Called Iritis Glaucomatosa.

INOUE, Japan. (*Die Ophthalmologische Klinik.*, 20 August, 1901.) The case was that of a young man with trachoma and intense ciliary and conjunctival injection. On the lower outer border of the cornea there was an old perforation of the cornea with incarceration of the iris. The cornea and anterior chamber were both cloudy. In the latter there was hypopyon about 3 mm. high. The iris was very much swollen. Fundus could not be seen and the tension was elevated. The eyeball was sensitive in the ciliary region. Marked epiphora and photophobia. In spite of the high tension the diagnosis of irido-cyclitis was made and atropia (1 per cent.) was used three times daily. The next day the pupil was very wide and the eye quite hard. The problem was which remedy to employ. If it were glaucoma, atropia was contraindicated and if it were irido-cyclitis eserine was contraindicated. Decision was made in favor of eserine. This was kept up for two days and pronounced improvement followed showing itself in clearing the cornea and in disappearance of the hypopyon and of the swelling of the iris. Pain and lacrimation had both disappeared and vision was $6/36$ ths. He interpreted the case as being one in which he had a change or transition of iridocyclitis into glaucoma which latter, when relieved, the iridocyclitis disappeared.

Corneal Ulcers of Gouty Origin and Their Treatment.

ABADIE, CHARLES, M. D. (*Die Ophthalmologische Klinik.*, 20 Juli, 1901.) The symptoms of conjunctivitis of this character consist in a feeling as though there were

grains of sand beneath the lids. There is usually little or no secretion. Many patients complain of inability to open their eyes on awakening at night when they must use their fingers to force the lids apart. This condition he calls a nocturnal cramp. The ordinary astringent solutions have little or no effect. Benzoate of sodium internally and irrigation with a mild alkaline solution give far better results. Corneal troubles on the other hand are more serious than conjunctival affections. The ulcers are generally marginal and sickle shaped and rarely serpiginous in character. The pain in these cases is usually very severe and is present as a rule, and is always more severe in the beginning of the trouble. Of course the constitutional treatment is the principal thing here and Abadie reminds us that salicylate of soda from one to two grammes daily in combination with sulphate of quinine is a valuable method of treatment. Abadie refers to a homeopathic remedy which he used with decided benefit, tincture of rhus toxicodendron in doses of fifteen to twenty-five drops a day.

The Mydriatic Action of Pilocarpine Solutions.

LILIENFELD, ERNEST, M. D. (*Centralblatt für prakt. Augenheilk.*, Mai and Juni, 1901.) The peculiarity of many of the pilocarpine preparations which are now on the market of producing more or less mydriasis has attracted the attention of Lilienfeld. He reports a case in which pilocarpine was employed and a mydriatic effect was produced. This effect has, of course, been long known and pharmacologists have endeavored to get a preparation which is absolutely free from this property. His communication comprises a number of clinical and physiological experiments and his conclusions are practically as follows. He does not think that we can dispense with this agent for as yet we have no satisfactory substitute, though it must be said that the article which we get from drug stores is generally to some extent untrustworthy and will doubtless remain so till it has been tested physiologically and chemically and in this way shown to be pure; before it is used for therapeutic purposes it should be tried on the human eye to see whether it acts properly and if so we can employ the article in our glaucoma cases with confidence. Inasmuch as changes take place in pilocar-

pine solutions after standing a long time he advises that only small quantities be put up and that after two or three weeks the solution be renewed.

The Nature of Neuroparalytic Keratitis.

BASTIS, J., M. D., Constantinople. (*Centralblatt für praktische Augenheilk.*, Juli, 1901.) The author goes over the various theories on this much discussed subject and comes to the following conclusions. The keratitis which we see in human beings after paralysis of the fifth in some cases is undoubtedly caused by the dessication of the cornea. It is really caused by trophic disturbances resulting from a lesion of trophic fibres which are found on the inner side of the fifth and which many observers claim arise from the sympathetic. In support of this view Bastis reports the following case. A woman of thirty years was affected with complete anesthesia in the region of the branches of the right fifth nerve. The right side of the face, of the mouth and the tongue were absolutely insensitive to irritating influences. The movements of these parts were normal. There was slight ptosis and the eyeball lay somewhat in the orbit. The intraocular tension was diminished. The movement of the orbicularis was normal. There was absence of the corneal epithelium except of a small peripheral portion of an area of 3 mm. The parenchyma was the seat of a thick clouding. The tear secretion was lessened but the eye was apparently well moistened. Vision was considerably reduced. The case belonged to that rare variety of neuroparalytic keratitis where the peculiarity lay in the fact that trouble had never gone on to sloughing of the cornea. It is interesting to note the fact that neither a trauma nor dessication alone could be blamed for the keratitis. The eye was well moistened and the ptosis protected it from trauma and dessication. We are justified then in concluding that the keratitis was due to trophic disturbances caused by paralysis of the fifth pair.

The Development of Young Myopic Eyes When Provided With Glasses Which Correct all of the Myopia.

PFALZ, M. D., Düsseldorf. (*Münch. med. Wochenschrift*, 17 September, 1901.) This is the title of a communication made at the last meeting of the Heidelberg Ophthalmological Congress. The author takes the well

known German view of the subject of correction of myopia and comes to these conclusions. In young myopes full correction should not be made. Spectacles should always be prescribed (in preference to eye glasses) with periscopic lenses especially when the myopia is over 2.5 dioptries. Young myopes should always be kept under close observation. It is an open question whether in this way we can prevent the further progress of myopia.

Large Doses of the Iodine Preparations In Ophthalmology.

NOBBE, M. D., Berlin. (*Zeitschrift für Augenheilk.*, September, 1901.) This method of treating some of the diseases of the eye has been given a great impetus by the communication of Pagenstecher in 1897 and now Nobbe, a former assistant of Pagenstecher's, has taken up the subject and reports a number of cases where the various iodine preparations were employed. A number of cases of episcleritis are reported where excellent results followed the administration of large doses of iodide of potash. The doses generally ranged from thirty to forty grains of the iodide of potash which were given three times daily, and even as often as five times daily. The same good results were obtained in paralysis of the ocular muscles and he reports quite a number of cases under this head. Three salts of the drug were employed, the iodide of potash, the iodide of soda and the red iodide. He prefers the latter as it is less likely to produce iodism and it produces no bad effect upon the heart. Iodide of sodium is generally better borne than iodide of potash. The addition of the bromide of potash is advisable as it has the effect of quelling the heart's beat which is so often accelerated by the iodides.

Optico-Ciliary Neurectomy In Absolute Glaucoma.

GOLOWIN, S., M. D. (*Zeitsch. für Augenheilk.*, Juli, 1901.) Golowin's communication is based upon the observation of thirteen cases in which optico-ciliary neurectomy was performed. He finds among other things that the operation does not materially influence the high intraocular tension peculiar to glaucoma but notwithstanding this fact he regards the operation as a useful one. The glaucomatous pain rarely fails to disappear completely. Of course it may recur in cases where there is complete regeneration of the posterior ciliary nerves. From a cosmetic point of view the operation is a success and while degenerative changes may

sooner or later make their appearance, for all that, the eye is apt to closely resemble its fellow for at least the first few years after the operation. He thinks the operation may be supplemented by an iridectomy which still further tends to keep the eye in a painless condition, and strengthens the good done by the optico-ciliary neurectomy and as a matter of fact such eyes, after optico-ciliary neurectomy, are easily iridectomized. He thinks that the operation is indicated in all cases of absolute glaucoma associated with pain and where enucleation is usually performed. In cases, too, of absolute glaucoma without pain but where pronounced degenerative changes make an iridectomy dangerous, it is a valuable operation. It is especially indicated in those cases where operative measures have been tried and where pain still exists.

Contributions to Cataract Extraction.

DIMMER, PROF., Gratz. (*Zeitschr. für Augenheilk.*, Aug., 1901.) Dimmer has given us an account of his cataract operations during his career in Innsbruck. It might be of interest to note the character of his preparations for the operation. The cilia of both lids are cut off short. The lids are then scrubbed with a soft soap and then carefully washed with a solution of hydrarg. oxycyanat, 1:2000. The conjunctiva and tear channels are also irrigated with the same solution and the eye is closed with a Fuchs shield. He lays much stress upon cutting the eye lashes as this step enables us to thoroughly disinfect the lids. In cases where the hairs of the eye brows are long and bushy these are also cut off. When the tear sac contained abnormal secretion it was extirpated. These steps were undertaken the evening before the operation. Immediately before the operation the shield was removed and the lids washed with neutral soft soap, cocain was instilled and the conjunctival sac irrigated with the hydrarg. oxycyanat. solution. Five per cent. cocain solution was used and this was sterilized by boiling. The instruments were boiled in one per cent. soda solution five minutes and he has never noticed that this procedure caused dullness of the cutting edge. The hands of operator and assistants should be cleansed with soap, sterilized nail brushes and with either sublimate solutions or with lysol. They should wear sterile aprons provided with short sleeves reaching to the elbows. The

head of the patient is covered with a sterile cloth which has been soaked in a 1:1000 sublimate solution and a similar covering is placed over the chest. The face is covered with a gauze veil which has also been soaked in the sublimate solution and in this a hole is cut which leaves free only the lids of the eye upon which the operation is to be performed. After the operation no bandage is applied but simply a Fuchs shield. In other words the so-called open treatment is employed. The eyes were opened daily and cleansed. Generally the patient was kept in bed for only one day. In a number of cases the discission was made fourteen days after the extraction. The average normal course of healing was from eighteen to twenty days. Three hundred and sixty-one cases were operated upon. One hundred and fifty-eight were simple extractions and of these, five were failures. Two hundred and three were operated upon with iridectomy and of these seven were failures. The chief points of interest in Dimmer's communication are his preparations for the operation.

Injury to the Eye at Birth.

BYLSMA, M. D., Middleburg, Holland. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 45, 1901.) The author reports a case where the infant was injured at a forceps delivery. Both the upper and the lower lid of the left eye were swollen and of a dark livid color and it was with great difficulty that the cornea could be seen. The conjunctiva was chemotic around the cornea yet there was no exophthalmos. In a few days the hyphema began to disappear and later on a slight iridodialysis was plainly visible. The ophthalmoscopic examination was negative. According to the author this was the first case of the kind reported, that is to say, of iridodialysis after forceps delivery.

The Eyegrounds in General Diseases.

LITTER, M. D. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 42, 1901.) The author has reported thirty-five cases of septicemia and in twenty-eight of these cases there were marked changes in the eyegrounds. These changes generally made their appearance a few days before death. There were generally small white round spots which were seen in the region of the papilla, never near the macula and without any relation to

the bloodvessels. There were also numerous flame shaped hemorrhages. Foci and hemorrhages developed with great rapidity often in the course of an hour. Among the twenty-eight cases there were eight with metastatic panophthalmitis in which there were no ophthalmoscopic changes. Herrnheiser confirmed these results in those with septicemia but he has never observed these changes in lying-in-women. The changes, however, are no criterion as to prognosis for they occur in light as well as in serious cases, and they may disappear. Similar changes are seen in Bright's disease, pernicious anemia, diabetes, etc.

A Contribution to the Pathological Anatomy of Glaucoma.

v. HIPPEL, EUGENE, PROF., Heidelberg. (*Archiv. für Ophthalmologie*, LII Band, 3 Heft.) Hippel's first case was that of a man who had been practically blind for fourteen years, not being able to tell light from darkness. A sudden attack of glaucoma necessitated enucleation a few weeks after the beginning of the attack. It may be added that neither miotics nor paracentesis had the slightest effect upon the tension and inasmuch as the eye was blind it was enucleated. The chief interest of the case lies in the fact that it represents a very early stage of the disease, that is to say, early for anatomical study to have been made and the point was to ascertain whether the anatomical condition would explain the heightened tension which neither eserine nor paracentesis relieved. The filtration angle was wide open and there was nowhere a close approximation of the iris periphery to the filtration zone. The ciliary processes were not directed forward but on the contrary were pointing somewhat backward and there was absolutely no narrowing of the circumferential space. Schlemm's canal was everywhere wide open and was filled with blood. But what was very marked was the dense infiltration of the trabeculæ about the canal with pigment cells which of course justified the conclusion that we had here an obstruction to the filtration process. This same condition was found very marked in another eye which v. Hippel enucleated under pretty much the same conditions. In this case he found masses of pigment imbedded in the filtration angle. It is well known, however, that this condition is not peculiar to glaucoma nor is it constantly found. The author does not express himself

as positively certain that this infiltration with pigment is the cause of the increased tension but he is undoubtedly inclined to the view that such a condition was a factor in his two cases. It must be said in conclusion that this pigment emigration so to speak has been observed by Panas and others in intraocular hemorrhages, melanosarcomata as well as in glaucoma. The author then proceeds to speak of the origin of the pigment.

The Pathogenesis of Methylalcohol Amblyopia.

BIRCH-HIRSCHFELD, M. D., Leipzig. (*Archiv. für Ophthalmologie*, LII Band, 2 Heft.) The author first goes over the historical side of this subject and refers to the contributions of Holden, Masius, Druault and others. His experiments were performed on rabbits and dogs. The methylalcohol was mixed with the distilled water in the proportion of half and half in order to avoid the irritating effects of the alcohol upon the mucous membrane of the stomach. It was dropped into the mouth through a pipette. The first effect was seen in rabbits generally after the administration of 15 cm. Ophthalmoscopic examination never revealed anything abnormal. His conclusions are as follows: The action of the methylalcohol upon the visual organ consists in the first place in changes in the nerve cells and secondarily in the nerve itself. We can have also, secondarily, changes in the optic nerve, but even here only a portion is involved and normal fibres are often to be seen. That portion of the optic nerve which is involved shows not the slightest evidence of an inflammatory process. Methylalcohol amblyopia in human beings from a clinical point of view resembles closely chronic alcohol amblyopia. The results obtained in these experiments agree pretty generally with those of Rymowitsch.

Experiments to Determine the Effect of Iodoform Rods when Introduced into the Vitreous

OLLENDORFF, M. D., Königsburg. (*Zeitschrift für Augenheilk.*, Juli, 1901.) It will be remembered perhaps that in 1897 Ostwald showed that iodoform, when introduced into the anterior chamber of rabbits, produced absolutely no irritating effect and that this was a valuable method of treating certain infectious diseases of the eye. Haab has employed this method in human beings by introducing small rods made of iodoform into the vitreous. Ollendorff's

experiments were made on rabbits and the iodoform was introduced in the form of little discs through an incision posterior to the insertion of the superior rectus. Some experiments were also made in which the powder was introduced through a trochar-like instrument. The experiments showed that pure iodoform after introduction into the anterior chamber exercised no irritating influence and is gradually absorbed.

The Surgical Treatment of Strictures of the Nasal Duct.

PASSOW, PROF., (*Münch. med. Wochenschrift*, September 3, 1901.) describes a class of cases where the usual efforts to get rid of the blenorrhea have been ineffectual and where the patients refuse to have the sac removed. He suggests splitting open the nasal duct on the inside. He is convinced that this method of treatment is valuable and that the operation is much easier than is generally supposed. First of all the anterior end of the lower turbinate bone is removed under cocaine anesthesia. A Bowman sound is then passed into the nasal duct in the usual way. Then as much of the turbinate crest of the upper jaw and of the lacrimal bone is removed with a gouge as will leave the canal open all the way up to the lacrimal sac. One can make sure of this by ascertaining whether the sound is freely movable. As a last step the canal is slit open along the sound with a small probe pointed bistoury and if this is successful one can readily introduce a sound through the lacrimal canal into the nose and freely move it about. This last step is made under general anesthesia and a few days after the patient has recovered from the effects of the removal of the portion of the inferior turbinate. He reports three cases in which the blenorrhea had proved very obstinate and in all of these he obtained successful results by this procedure.

A Shot in the Anterior Chamber for Eight Years.

BURSTENBINDER, M. D. (*Archiv. für Ophthalmologie*, LII Band, 3 Heft.) The patient was a man who had been shot in the face eight years previously and one of the pellets had penetrated the eyeball. During all this time one of the shot had remained out of sight in the anterior chamber without giving rise to any inflammation and without in any way affecting vision. The pellet must have expended its force on passing through the cornea for it apparently

dropped to the bottom of the anterior chamber. Whether the iris was perforated was not determined. There was probably no perforation of the lens for there was only a slight circumscribed clouding of the latter. There was a slight choroido-retinal rupture which must have been the result of the counter-stroke. The case by the way had been characterized by strabismus concomitans. Burstenbinder thinks this condition was due to the pellets which were imbedded in the neighborhood of the inner orbital border in other words, that an injury of the tendon of the internal rectus had been caused by these pellets on the way into the orbit and that as a result a certain amount of cicatricial contraction followed which had led to shortening of the muscle and strabismus. In the same way he explained a slight ptosis which was present as being due to a lesion of the levator or of a nerve branch. The absence of anatomical changes in the eye showed that the pellet was sterile and that lead can give rise to no trouble in this locality.

An Anatomical Examination in a Case of Exenteration which was Performed to Prevent Sympathetic Ophthalmia.

RUGE, M. D., Greifswald. (*Archiv. für Ophthalmologie*, LII Band, 3 Heft.) The author discusses the relative value of the various operations performed to prevent sympathetic ophthalmia and he thinks that if there is any trace of the uveal tract remaining on the stump after exenteration it is clear evidence that the method is untrustworthy. He then proceeds to report a case which came to Schirmer's clinic. Very careful microscopic examination was made. Pigment was found in the scar tissues of the optic nerve stump, pigment which he thinks undoubtedly came from the uvea and which goes to show that the chorioid is not completely removed in the operation of exenteration. He thinks that the presence of portions of the uvea at this point means undoubtedly the presence of some of the organisms which were in the injured eye.

The Changes in the Macula Lutea After Contusion.

FUCHS, PROF. (*Zeitschrift für Augenheilkunde*, September, 1901.) Haab and Kuhnt have recently called attention to a new variety of macular disease. It consists of a red disc $\frac{1}{2}$ to $\frac{1}{3}$ the size of the papilla which looks as though the retina had a perfectly circular opening in it through which one could see the uncovered chorioid.

According to Fuchs the peculiarity of the picture lies in its close resemblance to a hole and in the absence of significant changes in either the pigment epithelium or in the chorioidal stroma while ordinarily diseases of the macula are characterized by participation on the part of the pigment epithelium and of the chorioid. Fuchs has recently made an anatomical examination of a case which was injured in this way. He describes the anatomical details carefully and notes the absence of what we usually find after bad contusions of the eyeball. There was evidence of a very slight inflammation. Leucocytes in small quantities were found in the inner surface of the retina. This kind of emigration is what we would expect in inflammatory edema. Fuchs thinks that the inflammation started in the anterior part of the eye and that from this region inflammatory substances came to the retina and that the latter in the region of the yellow spot was at first uniformly infiltrated with the fluid which caused the edema but later on became separated from the remaining tissue, this being favored perhaps by the very delicate character of this part of the retina and especially by the absence of supporting fibres. This explanation throws light upon the character of the sharply defined hole which we see with the ophthalmoscope. I need not go into the lengthy anatomical description.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

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(Quarter ending September 30, 1901.)

TRANSACTIONS OF THE EIGHTEENTH MEETING OF THE NETHER-
LANDSOPHTHALMIC SOCIETY AT UTRECHT, DECEMBER 23, 1900.

Normal Winking.

DR. L. J. LANS mentions his experiments for discovering the cause of normal winking. He found that cooling, drying of the cornea, irritation of the retina, or the presence of tears could not be considered as causative factors. Theoretically, the absence of winking when the eye is submerged might be due to one of the following causes: a probable change in tension, the rythmical displacement of the bulb, or the temporary presence of a large quantity of tears in the lacunae or in the inferior conjunctival sac.

Discussion.—DR. NICOLAI thinks that the rotation of the bulb which occurs simultaneously with the closing of the lids, might be one of the causes of winking. Dr. Lans considers the greater frequency of winking in follicular catarrh to be due to the increased lacrimation and not to the changed conditions of the conjunctiva. Winking continues regularly on both sides irrespective of corneal or conjunctival anaesthesia. Neither can the formation of the retinal image be considered as a cause since winking continues to take place in the dark. With regard to

the question of rest of the ocular muscles as a cause of winking L. found the reverse, viz., that nearly every movement of the bulb was followed by spontaneous winking. Neither does he believe that the tonus of the levator palp. sup. has any influence on their number or quality as they take place normally even in bilateral ptosis.

Determination of the Length of the Eye In Vivo.

DR. G. J. SCHOUTE makes the following preliminary report: He sought for two lines which would travel unrefracted through the eye and meet at the retina. The distance of this point from the cornea will give us the length of the eyeball. The determination of the anterior surface of the cornea will be easy by the use of a flat point, which is placed at a distance from the cornea equal to the breadth of the point. Of the two lines which meet at the retina, the one passes through the point of rotation and the other through the nodal point. The point of rotation can be determined by a very simple method according to Prof. Koster in the *Archives Néerlandaises*, XXX, p. 370. S. advises the following method for determining the nodal point. We know one line on which the nodal point lies, viz., the fixation line. This line also passes through the point of rotation. We only need a second line which passes through the nodal point and passes on to the point of contact on line No. 1. For this construction we place two points on the line of chief fixation and fix for the farthest, then both points cover each other because the middle of the dispersion circle, which belongs to the nonfixed point, lies on the image of the fixed one. If we rotate the line containing these two points around the rotation point without changing the position of the eye, then they no longer cover each other because each point now has its own line of direction which goes through the nodal point and meets the retina at different places. Furthermore the middle of the dispersion circle does not now lie on the line of direction, because it does not pass through the middle of the pupil. The line which contains the two points must now be made to pass through the nodal point. For this purpose a narrow slit is placed close to the cornea and we turn the points around the slit until the middle of the very much narrowed dispersion circle falls on the image of the eccentrically fixed point. This takes place when the straight

line which passes through the two points and the slit which acts as a pupil at the same time passes through the nodal point. Now we use the nodal point and the point of fixation for the construction of lines that shall meet at the retina. While giving the eye a central fixation point we illuminate a point on the periphery of the retina until an after image appears. Then we move the central point and allow the eye to follow it, the after image moves with it. We guide it along the original direction of the visual line until it lies a little to the side of it. We now note the position of the after image and the place occupied by the fixation point. Now two straight lines are drawn, one through the point which has evoked the after image and through the nodal point and the other through the point to which the after image is moved and through the now removed nodal point. The point on the retina occupied by the after image was located on the first line before the turning, but on the second line after this. Two more lines must be constructed. Both pass through the point of rotation, the one through the central fixation point in the first position and the other through the central fixation point in the second position. The angle they form at the point of rotation indicates the amount of rotation that has taken place at each point of the retina. We now turn the sides of this angle over the two nodal point lines until the points of contact are removed equal distances from the point of rotation. These two contact points are two retinal points and their distance apart is equal to the radius of the eye. With this radius we construct the posterior segment of the eye and find the posterior pole where this curve meets the visual line. The distance of the point of rotation from the posterior pole of the eye plus the distance of the point of rotation from the cornea equals the axial length of the eye.

A New Muscle in the Anterior Chamber?

DR. C. NICOLAI in looking for another muscle, which he thinks he has found, used the staining method of Von Giesen which stains everything belonging to the connective tissue group red, while muscular tissue is stained a lemon yellow. Nerve and epithelial cells are also stained yellow and therefore this method is not entirely reliable. Some of the specimens contained vertical sections of the canal of Schlemm.

The tissue lining the internal wall of this canal was stained a deep yellow much to his surprise. The color of this tissue corresponds exactly with that of the ciliary muscle. The use of hematoxylin in connection with the above method resulted in staining the nuclei so that they were in every respect similar to those of the ciliary muscle. The ligamentum pectinatum, whose individual bundles are covered with epithelium, was stained quite differently in these specimens.

Two Cases of Intoxication with Scopolamine Hydrobromate.

DR. HAZEWINDEL reports the following cases: I. A man 59 years old was brought to the hospital for iritis and keratitis. He was poorly nourished and had a cachectic appearance. The right eye was aphakic and the diseased left eye had a mature cataract. Salicylate of soda was given internally and scopolamine dropped in the eye every two or three hours. After a couple of days the patient became very restless and wouldn't stay in bed, his words were disconnected, he had hallucinations, and continually complained of seeing blood. This had lasted some time before I saw him. He was sitting in a chair, had a normal pulse, no apparent congestion of the face, answered questions, and complained of being weary and dizzy. He had forgotten everything that had happened during the period of restlessness. After stopping the drug the patient made a rapid recovery.

II. A robust young man of 17 years had been in the hospital since August with traumatic cataract and lens particles in the anterior chamber. Under atropine and rest the resorption progressed favorably. A half an hour before leaving the hospital a one-tenth per cent. solution of scopolamine was dropped into the eye instead of the usual atropine. In the car he began to feel uneasy and as he left it he felt as though he was drunk, after which he did not remember anything of what happened, he became demonstrative and made considerable trouble. He heard voices which he answered, had visual hallucinations, saw blood spots on his clothes. An hour afterward he again began to answer intelligently and his further recovery was rapid and uneventful. The solution was examined chemically but without results. The question arises whether the preparation did not contain hyoscine, which is much more poisonous.

The Infant's Eye.

DR. W. M. DE VRIES examined the eyes of 112 infants after instillations of a two per cent. solution of homatropine. In two cases he found the hyaloid artery in both eyes. The optic disc appeared much more grey, often greyish white and sometimes a greyish rose color. A pronounced physiological excavation was present in only seven cases, which is in harmony with Schön's conception, who considers this an acquired condition. The optic nerve of the infant does not possess hyalin sheaths and this may account for the difference of color. The pigment forms a decided marginal ring around the disc in 29 per cent. of the cases, much oftener than in the adult. The fundus appeared very light as the chorioidal stroma contains few or no pigment cells. He constantly found in the flattened specimens, that the bifurcated pigmented stroma cells were present in the exterior layers of the choroid although less than in the adult. The periphery of the fundus is darker. The ring around the disc, mentioned above, was the result of the decided pigmentation of the pigment epithelium. He could find no anatomical cause for the peculiarly grey color he found in the periphery of the fundus, whose appearance reminded him of edema of the retina or of ablatio retina. Retinal hemorrhages were present in 11 per cent. without anything special being discovered so far as the delivery of the child was concerned. Of the 112 infants that were examined for the refractive conditions the results of 78 were sufficiently reliable to be recorded as follows.

Myopic 4D.....1	Hyperopic 1D.....10
3D.....2	2D.....15
2D.....1	3D.....12
1D.....1	4D.....12
Emmetropic.....11	5D.....6
	6D.....5
	7D.....1
	8D.....1

With one exception the refraction of both eyes was alike. Astigmatism could not be detected with certainty, but was readily discovered as soon as in keeping the eye-lids open, a little too much pressure on the bulb was caused. If the refraction of the infants eye were to be determined by its

corneal curvature and its apial length it would be hyper-tropic to the extent of 25 D according to Axenfeld, D V. concludes then that the lens changes a very short eye with a pretty large corneal radius into a nearly emmetropic eye in the infant.

The lens keeps the growing eye emmetropic. It changes its refractive value so that although the relation of the axial length and the corneal radius changes constantly, the refraction remains nearly emmetropic enabling the eye to perform its function properly. De Vries concludes that emmetropia depends upon the lens primarily. This hypothesis is supported by the following facts:

I. The measurements of Schnabel and Herrnheiser of the fully matured emmetropic eye showed that the axial length of the eye varied between 22 to 25 mm. (that is circa 9 D) and these variations were not neutralized by any corresponding variations of the corneal refraction.

II. The lack of uniformity obtained in the measurements of the radii of lens curvature of different individuals by the same observers.

III. The finding of many cases of emmetropia with myopic changes in the fundus, due to increased axial length of the eye. D. V. believes this to be due to a decreased curvature of the lens surfaces.

Nervous Visual Disturbances.

DR. H. G. W. PLANTENGA as chief examiner of the eyes of recruits met with the 57 cases three of whom suffered from a traumatic neurosis, while the others were amblyopic. Dr. P. maintains that a thorough examination of the entire body is necessary for a diagnosis. Only in five cases was it impossible to find stigmata of hysteria in other parts of the body. One patient had amblyopia, nictitatio and photophobia without narrowing of the field or other stigmata of hysteria, yet later this one proved to be a case of simulation. In only four cases was there any decrease in the gross muscular strength. A general or circumscribed analgesia was often found of interest because the want of pain sensation cannot be simulated. It was more common than a want of touch sensation. If the touch sense was diminished then the same was found with regard to the pain sense. In ten cases the pain sense was reduced or together wanting in whom the touch sense was normal.

Pressure in the hypochondrium caused a spasmodic convergence in both eyes in one case. A direct cause of the amblyopia could rarely be ascertained. With the exception of the four cases of traumatic neurosis a history of inflammation was obtained in only one case and of irritation due to manure gasses in another. In many cases the patient had not even been conscious of depreciated vision. In others an indefinite history of pain in and around the eye, especially at night, was the only symptom mentioned by the patient. In seven cases the binocular amblyopia was of a high degree while the remainder were of a medium grade. The changing nature of the vision was characteristic in seven cases. Concentric narrowing of the visual field was absent in only six cases. As the field of vision in these cases must be taken quickly, P. preferred the campimeter to the ordinary perimeter. A concentric narrowing of the field was present in all cases, except as noted although in variable degree. In general no constant relation could be detected in the concentration of the field and the reduced central vision. The change in the color fields, so that the blue falls within the red was found in $2/7$ of all the cases. Green blindness existed in two cases. Central scotoma were absent. Abnormally rapid fatiguing of the field was present in $1/3$ of the cases to a greater or less extent. The light sense was usually found to be diminished when tested by the Förster method. Hemeralopia was not complained of. The conjunctiva bulbi was often anesthetic, the cornea seldom. Photophobia was common and nictitatio was present in $1/5$ of all the cases.

A Simple Explanation of the Different Geometric Optical Illusions.

PROF. W. EINTHOVEN. (Extrait des Archives Néerlandaises des sciences exactes et naturelles, Serie II, Tome II.), considers the different illusions, particularly that of Müller-Lyer in a most interesting and instructive manner. He says, when one looks at a figure, only a small part can be seen distinctly at one time, viz., that part which has its image in the centre of the retina. The other points and lines, being projected on the periphery of the retina, are seen only indistinctly. When the eye passes over the figure every part will be seen successively, but always a small surface only at a time. The rest being seen indis-

tinctly. Strong reasons exist for accepting as a guide the centre of gravitation of the retinal image in the localization of the figure indistinctly seen. This allows that figure or part of figure with a definite form seem to change their places in indirect vision.

For instance $A \left| \text{---} \right| B \text{---} C \left| \right.$ in the paradox of Müller-Lyer BC seems larger than AB. When one fixes the middle point B, the ends A and C are seen indirectly and thus indistinctly. The end A is projected, according to the centre of gravitation of the retinal image, a little more towards B and the end C a little farther from B. So it happens that AB seems shortened and BC lengthened. When another point is fixed, e. g., C, A and B are seen indistinctly and so B and C if A is fixed; but whichever point is fixed, the result must always be the same: AB is relatively shorter than BC. The impression of a figure seen indistinctly can be represented in a striking manner by using diffusion circles. The phenomenon wants for its explanation the reduced vision of the periphery of the retina which coincides with the lessened sensibility of this part. The images are diffuse in the periphery,

The writer then proceeds to describe the different optical illusions and their explanation, measures their value through the figure of Müller-Lyer, calculates the vision in indirect sight, compares the results with those of others, and concludes that the small amount of vision in the periphery of the retina is one of the causes for the illusion. The indistinct perception in the periphery of the visual field is explained by the defective function of this part of the retina and the formation of real diffusion circles.

The above abstract can not do justice to Prof. Eindhoven's highly valuable and scientific study. The original should be studied by every student of physiologic optics.

The Mutual Relation Between the Retinal Image and Eye Motion in Judging Linear Measures.

A. SCHUCKINK KOOL under the direction of Prof. Eindhoven. Academical dissertation. We judge, through our visual sense of form, extent and distance of surrounding objects. We judge of these things not only by the form, extent and location of the retinal image, but also by the movements of the eye and head. Retinal images and

motion co-operate harmoniously to bring about the result. They can be separated. The writer desired to express in measure and number the value of the influence of the ocular motions and that of the retinal image in determining our judgment about linear measurement. He measured the length of lines on a flat vertical board at a distance of 120 cm. He made three groups of experiments: 1, to determine their length with the help of the retinal image and the ocular movements, using three light points, two of them having a constant distance and the third being movable in the same line, in a dark room; 2, to determine their length with the assistance of the retina only using momentary illuminations; (Helmholtz) 3, to determine their length with the help of the ocular movements only. A point of light was fixed and then covered. The eye was turned to a point where the second light was expected. After a little exercise this place was easily focused. The second light was then extinguished and in the same way the third light was looked for, while the distance between the second and third light was compared with the distance between the first two lights.

With eighteen different kinds of experiments 1674 observations were made. The first two experiments were comparisons by direct observation, the third by memory. The quantity of innervation necessary for the muscle contractions had to be compared mentally. The greatest accuracy in estimating the length was attained by co-operation of the retinal and the muscle movements. Only very small distances were measured more accurately without the accompanying eye movements, especially was this true for monocular observations of vertical lines. Estimation without retinal images were always very faulty. The length of lines following each other in a straight line are estimated more correctly than when they form angles with each other.

The Recognition of Tuberculosis by Agglutination of the Bacilli.

P. RUITINGA delivered his dissertation under the auspices of the Amsterdam University which had made him Doctor Medicinæ cum laude. He took the above for his subject and divided it into four chapters: 1. Agglutination of microbes as a diagnostic aid. 2. Consideration

of researches concerning agglutination of the T. B. 3. Personal research. 4. Conclusions.

As primary tuberculosis occasionally occurs in the eye this subject may be of interest especially after the publication of the investigations of Arloing and Courmont, although Genmans could not agree with them. R. found that the agglutination of the Arloing T. B. is of *no* value for recognizing a tuberculous infection. He obtained positive results in many cases in which there was no infection and negative results in cases of demonstrated tuberculosis, even with a general good condition.

A Remark About the Contagiousness of Trachoma.

PROF. STRAUB (*Weekbl. v. Geneesk.*, Jan. 5, '01) mentions the opinion of Hirschberg in his latest work (*Klinisches Jahrbuch*, Jena, 1897): "that the contagious disease of the eye, which appears as an epidemic in the East and West Prussia, is trachoma," as against the opinions of Amsterdam ophthalmologists, viz., Snellen, Van Rynberk, Gunning and Blaauw. These declare that trachoma is non-contagious. To bring these opinions into harmony Straub offers the hypothesis, that trachoma is contagious especially in very young children and much less so for older children and for adults. He has several facts to support his position, especially the observations of Dr. Jitta in Jewish schools. S. advises greater care in the homes and the kindergarten, where trachoma is present and suggests, that the age factor be given more prominence in the statistics and that the cases of probable contagion be more carefully described.

The Development of the So-called Musculus Dilator Pupillae in Man.

W. M. DE VRIES (*Weekbl. v. Geneesk.*, Jan. 12) examined the eyes of new born and infants with Grünert's method (*Arch. f. Augenheilk.*, 1898) in which he bleaches the pigment without much lesion of the tissues. Grünert found a layer of rod-like nuclei in radiating form in a fine radiating striped basic substance between the membrane of Bruch and the retinal layer of the iris. These rod-like nuclei within Bruch's membrane are so similar to smooth unstriped muscle-tissue, that it can scarcely be anything else. If only one layer of epithelial cells is behind these oval nuclei instead of two, then this second layer must have disap-

peared during development. D. V. investigated the behavior of the second layer. In the youngest specimen he found the double epithelial layer, but no vestige of a dilator or a membrane of Bruch. He saw how the anterior epithelial layer underwent peculiar changes in older eyes. The cell-limits become indistinct; the nuclei from a round oval and from an oval gradually become rod-like, while a finely striped layer formed itself at the anterior side of the nuclear layer, which becomes broader and gives all the color reactions of a smooth muscle tissue. This change is found from the iris base up to behind the sphincter, and not up to the pupillary margin where two epithelial layers are always found. The so-called dilator pupillae has also an epithelial origin in the human being. This explains the difference from other unstriped muscle tissue. The nuclei of the dilator are in the posterior plane of the contractile layer, they are never so typically rod-like, always more oval, than of true unstriped muscular tissue.

Binocular Vision and Hering's Fall Experiment.

C. NICOLAI (*Weekbl. v. Geneesk.*, Jan., 1901) describes the following condition: A thirteen year old girl, with a vision $\frac{6}{12}$ in each eye with — 1.75 sph., and a-R. of seven D. has divergent strabismus. The right eye fixes and crossed images are easily aroused. Simple stereoscopic figures are combined, but the left image of the more complicated are negative. Patient makes only three mistakes in thirty with both eyes, and with one eye thirteen in twenty-three (Hering). This is the third case, where the depth measurement was much better with both eyes than with one, nevertheless binocular single vision failed.

GREEF (*Klin. Monatsbl.*, Nov., 1895) described a squinting girl, 14 years old, who could not see stereoscopic, but made only two mistakes in 100 with Hering's fall experiment, when using both eyes, and 50 mistakes in 100 when using one eye.

SIMON (*Centralbl. f. Prakt. Augenh.*, 1896) saw an eleven year old squinting girl, who could not see stereoscopic figures and could in no way be made to see double. With Hering's valproef she made only one mistake in 34 with both eyes and 11 in 27 using one eye. We may conclude that a good test with the fall experiment does not demonstrate the presence of binocular single vision. Binocular vision may

be divided into: I. Binocular vision in which an image is formed in both foveae: visus binocularis fovealis. II. Binocular vision in which the fixed object forms an image in the fovea of one eye and to the side of the fovea of the other eye. This form is found in all squinting persons in whom both eyes are sensitive to light: visus binocularis simultaneus. This must be divided into (a) visus binocul. simult. with depth sensation. (The three described cases belong here) (b.) visus binocul. simult. without depth sensitiveness, and as a particular form the visus binocul. alternans. This includes the common forms of strabismus concomitans. The visus binocul. alternans must be considered the principal form and is found in most animals. Binocular single vision does not exist, (a) is a higher degree and the highest degree is No. I. Gradually a centrum for binocular single vision, a localization centre, must develop, which must be in close connection with the convergence centre. This connection is shown by our power to gauge distance. We must distinguish between depth and sensitiveness and depth appreciation. N. believes that the place, where we localize a point in space does not depend upon the degree of convergence, but upon the direction of the projection axis. The point is situated at the place, where both axes meet (Giraud-Teulon). He demonstrates with this theory that it is of no importance whether both foveae find the same point, if only a good working localization centre exists. This centre must functionate normally, as otherwise localization becomes disturbed. This is the case in paralysis of an ocular muscle, when both the centres of localization and convergence are abnormally innervated. The proper connection between the two eyes is destroyed and so the power is lost to compare carefully the size of the projection angle.

Color Hearing.

DR. BYLSMA (*Med. Weekbl.*, March 9, 1901) gives the outlines of the phenomena and theories of color hearing and accepts Lusanna's theory: that the centres for hearing and sight are sometimes so intimately connected that the excitement is transferred from the one to the other.

Contribution to our Knowledge of Ophthalmomalacia.

PROF. W. KOSTER (*Weekbl. v. Geneesk.*, April 27, 1901) operated on a twenty-five year old lady for myopia gravior

according to Hess-Sattler method of lens extraction, on Jan. 5. By Feb. the tension was again normal. Six months later the patient again presented herself with symptoms of phthisis bulbi. After several inflammatory attacks a very fine opening was found in the cicatrix on Nov. 8. The next day it appeared as if a very delicate clear membrane closed a small slit-like opening about half a millimeter long. After cauterization fluid flowed from the eye through the anterior chamber remained normal. Bandages were applied. This cured the disease so that the diagnosis had to be changed to fistula bulbi. The difficulty that caused the error was, that the anterior chamber always appeared of the normal depth as found in the aphakic condition; the result, from complete fluidity of the vitreous, which communicated with the anterior chamber through little openings made in the membrane at the time of discission. As many of the reported cases of ophthalmomalacia give a history of trauma we may doubt whether the diagnosis is always correct. Although in some cases it seems proper for the present to retain the conception that there may be a decided disturbance of nutrition (secretion-neurosis).

Antero-Posterior Displacement of the Bulb Under Changed Conditions of the Positions of the Lids.

DR. TUYL (*Weekbl. v. Geneesk.*, May 18) refers to Müller as the first to describe an anterior movement of the bulb simultaneously with the enlargement of the lid cleft. He proposes for this the following hypothesis: "The normal opening of the lids, when the projection is not altered, coincides with a strong innervation of the Sup. and Infer. obliques, which muscles draw the eye forward."

Tuyl comes to the following conclusion: The eye moves forward and downward when the lidcleft opens voluntarily, because by the contraction of the levator palp. sup. pressure is exerted on the posterior superior side of the eye, while at the same time pressure on the anterior side by the lids is diminished. The eye moves backward when the eye lids close voluntarily, as this is the result of the contraction of the orbicularis no less than of the relaxation of the levator palp. superior.

Conjunctivitis Blennorrhoeica Neonatorum.

W. H. SMIT (*Weekbl. v. Geneesk.*, May 11) gives a his-

torical sketch of the treatment for the past fifty years. In experiments on rabbits eyes' S found that the strongest solutions of silver-nitrate and potass. permang. which would not destroy the epithelium was 1 to 500. For comparing the relative antiseptic value of these two he used staphylococcus cultures and found that the bactericidal properties of potass. permang. are practically nil, while the silver-nitrate in a 1 to 500 sol. killed the staphylococcus in three minutes. A specific action of the permang. of potass. in gonococci-infection is very improbable although clinical experience has taught us its value in gonorrheal inflammations of mucous membranes, so that its action must be explained in some other way. In the four years from 1897 to 1900, 108 cases of blenn. neon. occurred among 18,285 patients or 0.59 per cent. Restoration of vision was obtained in 67 per cent.; diminution or loss of vision in one eye in 15.4 per cent.; diminution or loss of vision in both eyes in 17.7 per cent.; blind in both eyes 4.4 per cent.; blind eyes, 7.1 per cent.

At the present time the treatment is as follows: The physician treats the eye thrice daily with 1/1000 permang. of potass. solution, using Straub's syringe to reach the culdesac. When the secretions are abundant the eye is washed out every time "the child is helped," with 1/5000 sublimate solution and sometimes oftener. When no further progress is seen, a two per cent. solution of silver-nitrate is used twice daily, care being taken not to injure the cornea. Later again potass. permang. is used or a 0.25 per cent. solution of sulph. zinc and a 3 per cent. solution of boric-acid. As soon as the secretion lessens the number of washings is diminished. With pseudo-membranes iodoform is dusted on the conjunctiva and all caustics are avoided. Ulcer of the cornea is treated with iodoform and atropine and sometimes with the sharp curette. The general health of the child is carefully looked after.

Elephantiasis Arabum of the Eye-lids.

DR. VERBEEK (*Med. Weekbl.*, Jan., 26) saw a grazier, without particular personal history, not having been to the tropics, whose left upper eye-lid began to swell intermittently six years ago without erysipelatous phenomena. A year ago the lower eye-lid also began to suffer. Small indurated spots, pale in color appeared on the upper lid.

When punctured a fluid appeared. The upper orbital margin is thickened and painful on touch. The eyeball is not affected. The brows are well developed and the body as a whole is normal. V. diagnosed it as pachydermia lymphangiectatica (Rindfleisch), although syphilis and a new growth must be excluded. All antisypilitic treatment has been of no avail. Thyroid tablets reduced the swelling, but the little spots remained. Later the left tonsil began to swell rapidly, so that V. concluded this was a benign affection which later became malignant in spite of all possible treatment. The use of the thyroid tablets had to be discontinued on account of toxic symptoms.

A Case of Conjunctivitis Petrificans.

PROF. W. KOSTER (*Weekbl. v. Geneesk.*, June 1) relates the history of the first case observed in Holland. Leber first called attention to this condition at Heidelberg in 1895. (See also Von Graefe's *Arch. Bd. LI.* 1900). The patient, a farmer of 21, came to the clinic at Leiden with his present condition in Nov. 1900. Formerly he had often suffered from kerato-conjunctivitis.

Status praesens: V. O. S. 8/18f, with cyl.—1D axis 65° V = 8/12f. corneal Maculae. O. D. There was a round white plaque 8mm. in diameter on the temporal side of the bulb, having a smooth shining surface and located about 1 mm. from the limbus corneae. It has the appearance as if it had been burned a few hours before. The surrounding area is slightly swollen, is intensely red and there is both superficial and deep pericorneal injection. In the cornea near the spot are a few dots that appear like maculae. V. O. D. = 8/60; refr. = E. Patient states that the white spot began to appear 8 days ago as a small point. The diagnosis is verified by Prof. Leber. (The author sent three stereoscopic photographs, a detailed description, removed tissue-tests). In the examination of the specimens acids must be used sparingly. Some symptoms point to a probable relation with tuberculosis. This patient had suffered from ophthalmia scrofulosa (see Drs. K. Preisich and N. Berend, *Woch. f. Therapie u. Hygiene des Auges*, 1901, No. 18 S. 144.) Petrification of tissue, which is exposed to the air, is not rare in tuberculosis. Furthermore the good effects of iodoform in these cases is significant. That T. B. could not be found is of no great importance.

Brain Tumor, Operation, Cure.

DR. G. VAN WAYENBURG and D. MAC GILLAVRY (*Weekbl. v. Geneesk.*, June, 8) mention a case of angiosarcoma of the frontal lobe. The diagnosis of tumor had been made three months before the first sign of fundus trouble. March 16 a slight swelling of the disc appeared in the eye of the opposite side of the located tumor. March 23, a choked disc 3D high could be seen and the nasal margin of the left disc was 2D high, its temporal side being normal. The papillitis continued to increase for twenty days after the operation, while one hour after the operation the motility of the extremities and the abnormal voice-symptoms had disappeared. The authors consider that their observation favors the inflammatory theory of Deutschman with regard to the papillitis.

ABSTRACTS FROM RUSSIAN AND SCANDINAVIAN OPHTHALMIC LITERATURE.

BY

A. BARKAN, M. D.,

SAN FRANCISCO, CAL.,

AND

PROF. DR. A. KRUKOW,

MOSCOW, RUSSIA.

(Quarter ending September 30, 1901.)

Dislocation of Lacrimal Gland.

GOLOWIN. (*Meeting Society of Ophthalmology of Moscow.*) The speaker discussed the differential diagnosis between these diseases and ptosis adiposa. He demonstrated such a case in 1895, and described it in 1896 in the Archives of Ophthalmology. Later on he described a double sided dislocation in a patient 27 years of age, from whom he removed both lacrimal glands. There are nine more cases of this kind known. Four of them are of traumatic origin.

The treatment consists either in fixation of the lacrimal gland by suturing, or in extirpating the same. The lacrimal gland removed by Golowin showed interstitial inflammation and formation of new connective tissue. He demonstrated a patient with double sided dislocation of the lacrimal gland.

Extirpation of the Gangl. Nerv. Sympat. Sup. Dext.

DISSLER in the case of a woman suffering from chronic inflammatory glaucoma of the right eye. Patient had lost her left eye from glaucoma, although iridectomy had been made properly and at the right time. The operation was well borne by the patient, but had absolutely no influence on the disease. After, as before the operation, eserine would

produce a decrease in the glauomatous symptoms, when eserine was stopped a relapse of symptoms occurred.

The Cessation of the Flow of Tears and Changes Occuring in the Lacrimal Gland after Extirpation of the Lacrimal Sac.

TSCHERNO-SCHWARTZ. Moscow. The interesting results of experimental work made by the author are summed up in the *Zeitschrift, für Augenheilkunde*, No. 6, 1901, as follows :

1st, there is no doubt that at a certain time after the removal of the lacrimal sac the flow of tears will be diminished, or may disappear entirely. 2nd, though the flow of tears may have disappeared it may return temporarily under the influence of irritating factors. It's intensity however stands in an inverse ratio to the time which has elapsed since the operation. 3rd, the cessation of the flow of tears after removal of lacrimal sac is probably caused by a compensatory atrophy of the corresponding lacrimal gland. 4th, the fact of the cessation of tears and of the persistence of changes in the lacrimal gland after the removal of the lacrimal sac makes it probable that there exists a closer (probably nerve) connection between the two organs. 5th, no matter how large the quantity of the lacrimal secretion may be normally, it's excess may be removed by evaporation. A part of this excess is constantly carried away through the lacrimal canal.

A Contribution to the Dioptrics of Eyes Having Different Refractions.

AWERBACH. (*Inaug. Dist.*, Moscow.) Author considers the ophthalmophakometric methods of Tscherning as the best. Author made many measurements of the depth of the anterior chamber, the radii of the anterior and posterior surfaces of the lens, the thickness of the lens (casually also the angle *alpha*). All these dioptric factors vary greatly with different individuals. There is no strong relationship between them and refraction, but it may be stated that in myopia the anterior chamber is ordinarily deeper, the lens thinner and the radius of the posterior surface of the lens greater. The anterior surface of the lens is astigmatic generally in the same sense as the cornea. The posterior surface reversely. The astigmatism of the cornea may be as often equalized by

the astigmatism of the lens as increased. The lens of woman seems to possess a smaller power of refraction.

The Treatment of Trachoma with Ichthyol.

BELEWITSCH. (*Wojenno Medical Journal*, No. 8.) Belewitsch commences the treatment with 10 per cent. of ichthyol in glycerine, and used later on, a 20 per cent. solution. Cocain is applied first to alleviate pain. The solution is applied once or twice daily. In favorable cases the treatment lasts from three to four weeks, in more serious cases two months. Even the third stage of trachoma, though perfect healing is impossible, ichthyol still remains useful.

Pyoktanin in Trachoma and Other Infectious Diseases of the Eye.

RUDIN. (*Westnik, Ophthalm.* No. 6.) Rudin uses pyoktanin in solution 1 to 500. Apply it to the conjunctiva with a brush daily one to three times. According to his observation the papillary hypertrophies quickly decrease as does also the conjunctival secretion, and infiltration of the cornea is thus kept back. This remedy acts also well in cases of acute conjunctivitis. In ulcer of the cornea with hypopyon and as a disinfectant after operations on the eyeball, it is to be used as instillation (1 to 500 or 1000).

Ciliary Neuralgia in Consequence of Malaria.

OLLOWSKY. (*Wratsch*, No. 39.) The author has observed a ciliary neuralgia in his own case after an attack of malaria of four days, duration. Different remedies failed except a subcutaneous injection of quinine which brought on perfect recovery.

Development of Cataract Produced by Malaria.

KRAISKY. (*Westnik Ophthalm.*, No. 6.) The author mentions four histories of youthful persons who enjoyed good vision previous to the attack of malaria. All patients had cataracts in both eyes. No other cause for it. Patients in bad condition as far as general nutrition was concerned. Probably malaria is the cause of the disturbance. Author asks for further communications on this topic.

Contribution to the Etiology of Hemeralopia and Its Treatment by Liver Substance.

ZITRIN. (*Jeschenedelnik.*) The author observed 58 cases, and is of the opinion that the affection does not depend

upon nutrition, particularly its contents of fatty matter. It appears also independent of scorbutus or malaria. Nearly all the cases he observed, were well nourished and in every other respect perfectly healthy. He found in nearly all the cases a refraction of hypermetropia, and it is thought perhaps hemeralopia stands in some connection with retinal or accommodative asthenopia. Very bright light seems also to be a factor. As the disease appears epidemically, one would be inclined to think that it has an infectious origin, but the micro-organisms have not been found yet. The best results have been found by treating hemeralopia with liver or cod liver oil. According to the author's view, these act not through their fatty constituents but through some of the component parts of bile which seems to exert a reviving and specific influence upon the elements of the retina. As some observers seem to think that hemeralopia and diseases of the liver stand in some relationship to one another, this treatment assumes the character of organo-therapeutics.

Etiology of Acute Dacryocystitis.

WERNCKE. (*Westnik Ophthalm.*, No. 4 & 5.) Werncke has examined histologically 17 lacrimal sacs of patients suffering from trachoma, and found in most all of them trachomatous changes in the mucous membrane. He therefore thinks that trachoma of the palpebral conjunctiva may readily pass onto the mucous membrane of the lacrimal sac.

On Yellow and Yellow-Green Glasses.

DOLGANOW & KLIMOWITSCH. (*Wratsch*, No. 30.) According to investigations of Wildmark the ultra violet rays of light are kept back by the lens. Yellow green glasses produce the same effect, therefore the authors recommend them in aphakia. They are also well suited for work under electric illumination, in order to protect the retina from the effects of chemical rays of light. The yellow glasses also cause an increase in the visual sharpness for distant objects. They might therefore be useful for soldiers in shooting at long range.

ABSTRACTS FROM SPANISH AND PORTUGUESE OPHTHALMIC LITERATURE.

BY

ALBERT B. HALE, M. D.,

CHICAGO, ILL.

(Quarter Ending September 30, 1901.)

Cycloplegics in the Estimation of Refraction.

CHACON (*Gaceta Medica de Mexico*, 1st Jan., 1901), in a thesis read before the Mexican Academy of Medicine, demonstrates that in estimating refraction of Mexican people he has found it necessary to resort to the same methods so generally adopted in the United States, and not always accepted as necessary on the Continent of Europe. Chavez agrees with him and instances several cases in which an artificial myopia, uncorrected, in the hands of others had been overcome and the true refraction—hypermetropia—determined only after the use of a cycloplegic. This, of course, is nothing new to us in the United States but it is only one more demonstration of the fact of which we have long been aware, that the only safe method to adopt in almost all cases is the use of some cycloplegic.

Capsular Dissection in the Extraction of Luxated Cataract.

SANTOS FERNANDEZ (*Gaceta Medica de Mexico*, March 5, 1901) claims that there are many instances, especially of hard cataract, where the use of the cystotome is more apt to do harm than good and that a much safer way to proceed during the operation is to use the knife and as it passes across the pupil to make an incision through the capsule. He reports five cases where a Graefe knife was used to incise the capsule; in most of these the operation was quite successful. In case two, however, where he used the cystotome the zonula was ruptured and the nucleus sank out of sight. At first the patient had been able to

see but after a few days the nucleus was partially replaced in the pupillary area and became so adherent that vision was lost and the operation proved unsuccessful. He thinks, therefore, that if the condition of the capsule can be carefully estimated many cases will escape danger if the knife is used instead of the cystotome.

Cysticercus in the Anterior Chamber.

CHACON (*Gaceta Medica de Mexico*, 15th April, 1901) reports a case of cysticercus in the left anterior chamber in a native Mexican. This, so far as he can discover, is the first case reported from that country. The parasite plainly visible adherent to the anterior border of the iris but free in the anterior chamber was of a globular form which showed life by its spontaneous movements. The same author had, in 1888, reported a case in the country, but not of a native Mexican. Other cases have been reported as discovered in the cadaver.

Bullet Wound of the Orbit.

GAYOL Y SOTO (*Gaceta Medica de Mexico*, 1st of May, 1901) reports a case of a woman of 26 years of age who had received a bullet wound on the right side of the nose on the Fourth of July. The shot was fired at close range and there was considerable hemorrhage. The wound of entrance was ragged, the skin and bone powder stained and the right eye showed a moderate exophthalmos. There was orbital chemosis, mydriasis and turning of the cornea downward. Vision was lost. There was still some bleeding from the nose and general swelling around the orbit. The bullet could not be found but it was conjectured that it lay in the superior maxilla. Three days after the injury the X-Ray was used, when it was discovered that the internal and inferior plates of the orbit had been minutely fractured and that the ball was imbedded in the external wall of the right superior maxillary. The bullet was of 38 calibre. From this it was decided that there was a hematoma within the orbit and that the splintered bone had injured the internal rectus muscle and the branches of the oculomotor.

On the 10th of August the wound had healed, the eye looked more natural, the pupil was less dilated. A diplopia, which was the first symptom to show that vision was returning within this eye, had disappeared. The exoph-

thamos showed some retinal hemorrhage which was absorbing. On the 4th of October there was still some mydriasis, some outward deviation of the globe. Vision of about 1/10. Color sense was not destroyed. The field of vision was irregularly contracted. There was some optic atrophy. The case, as reported, is very interesting, showing what small results may follow such an apparently threatening injury.

Keratoconus.

CHAVEZ (*Gaceta Medica de Mexico*, 1st July, 1901) compares the two conditions which often lead to the same visual results and adds that while myopia is produced by pressure on the posterior part of the globe, keratoconus is the result of the same force working on the anterior part. His logic leads him to the treatment of keratoconus by the continuous use of myotics and the pressure bandage. He claims to have seen 82 cases within the last 11 years. In 16 of his cases there was no vision on account of the opacity of the cornea; in 11 others vision was practically nothing; in these cases, therefore, nothing was gained by treatment. In the 55 other cases where vision was better than 1/10, and especially in recent cases, a myotic and the bandage has been able to produce a complete cure. He instances a child of 13 who had been complaining for a year and in whom the far point seemed to be approaching rapidly closer. A moderate myopia correction increased the vision noticeably. While the glasses were being worn pilocarpine was prescribed and a pressure bandage to be worn at night. At first there was improvement but the patient neglected to carry out the treatment and things went bad again.

The minus lenses were increased in strength and the myotic with a bandage were emphatically ordered. At the end of two months improvement was noticeable. Astigmatism disappeared and the myopia was much less. Vision was nearly normal. After several months the patient stated that he could see at a distance about as well without as with the glasses which was proven by the test chart for both near and far. The author calls this a complete cure and ascribes his success to the persistence with which the treatment was followed.

He gives other cases in which relative good results were

obtained and says that recently he has added to the myotic and bandage, digital massage which he thinks is of value but has not as yet enough cases to warrant him in the expression of a decided opinion.

Asthenopia Retinalis in Sponge Fishers.

SANTOS FERNANDEZ (*Chronica Medico-Quirurgica de la Habana*, March, 1901) has decided to add to the many other occupation neuroses and especially to those affecting vision, the asthenopia occurring in those who, in the tropics, gather sponges below the surface of the water. He remarks the fact that exposure to the bright light is very apt to affect the retina, in some cases producing an hemeralopia. The ordinary retinal asthenopia is frequently enough observed in neuropathic or hysteric individuals, especially if there is an error in refraction uncorrected, but the subjects to which he refers are usually robust and healthy but they are exposed to the brightest rays of the sun and their eyes are kept in a continual state of congestion and strain, which we can understand if we notice the position they must adopt in carrying out their work. He gives several individual instances of sponge fishermen. One was a young man 21 years of age who for the last two weeks had noticed that his eyes were very bad when he looked toward the sun or on a white wall, everything seemed clouded and full of spots. In the shade everything seemed normal again. The eye, according to the ophthalmoscope, was normal—there was no astigmatism—and other conditions were normal. Asked as to the cause of this disturbance, he said, that his work was a fisherman for sponges. This work was immediately stopped for some time and with no other treatment the eyes soon became normal. Another case, a lad of 18, strong and perfectly healthy. For some days he had complained of black spots before his eyes, otherwise everything was normal. In gathering sponges, the fisherman is constantly leaning over the edge of the boat, resting on the sponges which he had already gathered and he looks through a cylinder at the side of his boat, the base of which contains a plate of glass. In this way he can see the bottom of the ocean and the movement of the wave does not interfere with him. When he sees the sponge he catches it with a kind of rake. The boat is in constant motion and conse-

quently the fisherman keeps his eyes nearly always glued to the tube. When he does raise his head the eye is at once exposed to the very bright sun. This must stimulate a retinal congestion which is encouraged also by the position of his head. The whole matter is easy to understand and is mentioned only to call attention to it.

Extraction of the Lens in High Myopia.

ALONSO, San Luis Potosi (*Anales de Oftalmologia*, June, 1901) claims to be the first to have operated for high myopia by extraction of the lens in Mexico. He has followed the traditions of Fukala and others. He now adds another case to those already reported by himself, in a boy 15 years old, who claims to have become rapidly near-sighted within the last few months. There was some astigmatism and under a mydriatic there was discovered about 14 D. of myopia with some choroidal atrophy. A classical dissection was made and six days afterward extraction of the lenticular mass with small iridectomy. The final result was a beautiful, clear pupil with the vision equal to $1/3$ and a very much enlarged field. In consideration of this case he is inclined to depart from the formula usually accepted, i. e., not to operate under 12 or when the myopia is less than the age of the individual.

Aniridia et Aphakia Traumatica.

GARCIA MANSILLA (*Archives de Oftalmologi Hispano-Americanos* April 1901) presented a case of a woman aged 74, who had a cataract in the right eye. She said that four years ago she had been struck by a cow's-horn in the left eye which had penetrated the lower lid. An intelligent niece of the patient noticed at the time that something had been squeezed out upon the cheek. The local physician who had been called, prescribed atropine and put on a pressure bandage. At the end of a month everything seemed normal, although her vision was very poor. Examination showed a slight scar on the lower lid and a broad cicatrix on the globe running about parallel with the edge of the cornea. The ophthalmoscope showed a complete lack of the iris. The ciliary processes were perfectly visible, the media was clear but no lens could be discovered. The eye ground was normal, vision was very poor but with a plus 10 D. lens and a small iris diaphragm, vision could be raised to $2/3$. The explanation is simple, of course. The lens and iris had been torn away but as there was no infection the wound had healed.

ABSTRACTS FROM RECENT ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending September 30, 1901.)

Treatment of Basedow's Disease by Sympathectomy.

TORNATOLA, S. (*Archivio di Ottalmologia*, May-June, 1901.) Jaboulay performed five operations on the thyroid gland in treating a patient with Basedow's disease, but without permanent improvement. He then severed the cervical sympathetic on the left side, February 8, 1896, and three weeks later, performed the same operation on the right side. In the following March and June he operated on two other patients in the same manner. This operation was suggested by the fact that two of the cardinal symptoms of Basedow's disease, i. e., the exophthalmus and the palpitation, can be induced by intense excitation of the sympathetic.

Jonnesco, in August of the same year, performed sympathectomy on a patient affected with Basedow's disease, but mere section of the cervical sympathetic did not seem to him sufficient, and he consequently extirpated the superior and middle ganglion in this patient as also later in others.

Soulié, in April, 1897, extirpated simultaneously the superior and inferior cervical ganglia. The majority of the cases so treated were much improved.

Operations on the cervical sympathetic in Basedow's disease have gradually become more and more numerous, especially by Jaboulay, Jonnesco and others, but only a single case has been published in Italy, that of Mariani. Tornatola adds to the literature the record of a case operated on in the ophthalmic ward of the general hospital at Messina. His patient was a woman of 22; her mother died at

44, of a liver affection and her father a few hours later, about the same age. She has one sister who is healthy. Her birth was normal and menstruation commenced at 14 and continued regular until April, 1900, when it was suspended. There had been no ocular disturbances before this, but at this time the right eye became red and painful and she applied to an ophthalmologist.

When seen by Tornatola, after the ocular affection had lasted a month, the left eye presented a small, horse-shoe shaped ulcer in the two lower quadrants of the cornea with much conjunctival chemosis and congestion of the iris. Exophthalmus was marked, the right eye more prominent. The patient recovered from the ocular affection, but thirty days later the same trouble recurred. It was treated for a month by an ophthalmologist in town, but as the patient continued to suffer, she entered the hospital clinic July 4. In examining the rather poorly nourished patient, the skeleton and muscles were found normally developed; the head, joints, abdominal organs and adipose tissue scanty, respiration negative; skin brownish; mucous membranes perceptibly discolored; mental faculties and organs of sense intact, with the exception of the eyes. The temperament inclined to be irascible. There was a slight tumefaction in the front of the neck, more plainly visible from the side, especially from the left. It extended from the external margin of the sterno-cleido-mastoid muscle on the right, and two centimeters beyond the muscle on the left, from the lower margin of the thyroid cartilage above, to the upper margin of the manubrium and the inner third of the upper margin of the clavicle below. The skin over it was not stretched and appeared normal. Pulsation was observed in the carotids, the right slightly displaced outward.

When the patient swallowed, the tumefaction followed the movements of the larynx, while it vanished when the sterno-cleido-mastoid muscles were gently contracted.

The skin over the tumor was movable and could be taken up in folds. Palpation showed that the tumor was constituted by the enlarged thyroid gland. All three lobes were enlarged, especially the right. The neck measured 24 centimeters in circumference. The thorax presented a convexity in front, most apparent on the left, and attaining its maximum toward the upper third of the sternum. The

angle of Louis was accentuated, the breasts flat and little developed, with quite long hairs on the areolae, nipples sunken. The apex beat was not visible, but the cardiac area was normal and the heart sounds were somewhat reinforced in the four foci. Pulse 100. Exophthalmus of 1.5 cm. in the right and of 1 cm. in the left eye. An ulcer occupied the two lower quadrants and two thirds of the thickness of the right cornea. The lids covered only about a third of the ball.

In the left eye there was a small ulcer in the center of the two lower quadrants, with infiltrated edges and bottom. The cornea retained its sensibility intact, but Graefe and Stellwag signs were missing.

After the usual disinfection, three stitches were taken in each eye as follows: Two needles were threaded with strong sterilized silk and one was inserted along the anterior surface of the tarsus in each lid, and two or three sterilized beads were threaded on each thread. The lower and upper lids were then approximated and fastened together. The knots were untied every day to wash out the conjunctival sac and the cornea with a 1 : 20,000 solution of sublimate, and allow the appropriate treatment, after which the edges of the lids were approximated again and the stitches tied. The knots used were the "bird's-foot knot," which Tornatola has found extremely convenient in his practice for a long time. It not only protects the eye but allows repetition of local treatment every day. He has found it far preferable to Meckel's method or simple metallic suture or the excision of small straps of the epidermic layers according to Arlt. He is confident that by it he has saved a number of eyes with paralytic lagophthalmus, corneal ulcer, ectropion, kerato-hypopyon, etc., which would inevitably have been lost if treated by any other method.

In the patient under discussion, improvement was evident in the first twenty-four hours and the cure was of the left eye, complete in eight days, and of the right, in fifteen. The patient returned, however, August 15, with a new infiltration of the two lower quadrants of the right cornea and a small infiltration in the left. Once more the patient was cured, with no trace left except a slight leucoma in the right eye. In this condition the patient was directed

to the medical wards where she received appropriate treatment, but returned again September 2, to the ophthalmic ward with a small corneal ulcer in the right eye.

She was placed in a fairly isolated apartment, as free from dust as possible and a bandage was applied to the eye, which, without touching the cornea, protected it from external injury. Notwithstanding these measures, the corneal ulcer continued a progressive course, compelling renewed suture of the lids as above described. But by this time the skin of the lids had been subjected to so much maltreatment that it tore readily where the sutures were applied, especially as the protrusion of the eyeballs rendered it necessary to stretch the lids in order to cover them.

In the meanwhile, both corneae had become somewhat infiltrated throughout their entire surface owing to the inadequate protection afforded by the lids. The right was ulcerated in the lower portion and there was considerable chemosis of the bulbar conjunctiva. It was therefore decided to perform tarsorrhaphy according to Wecker, which was accomplished October 12. The exophthalmus, however, in combination with the chemosis, exerted such traction on the lids that the margins were only partially adherent and finally broke apart. In this state of affairs, Tornatola decided to resort to sympathectomy and the operation was performed by Prof. Salomoni November 27, under chloroform, preceded by morphin and atropin. The superior ganglion of the sympathetic was isolated, resected and removed. The pulse was at first 100 and fell to 94 later, returning to 120 in two days. The patient complained of much dysphagia and profuse salivation, both transient. Sensations of heat and pain, taste and smell remained normal, but the patient noticed a certain numbness in the neck and ear of the right side. The infiltration and chemosis in both eyes increased. The lids were again sutured, and the conditions improved, but the stitches tore out and the ulceration in the left eye grew constantly worse, requiring exenteration of the eye December 24. The right eye was protected with the membrane of an egg, but the infiltration continued until it extended over two-thirds of its surface, and by January 15, ulceration was apparent. Tarsorrhaphy was then resorted to again, but this time

supplemented by transplantation of a flap from the temple, and the eyeball was covered, except for a slit of 3 mm. This was closed by a flap from the nose, February 10, (at which time the exophthalmus was much less noticeable than at the time of the sympathectomy) supplemented by another transplantation in March. The defect left in the brow is to be closed by a flap from the arm. The condition, May 24, was fairly satisfactory. The flaps cover the cornea sufficiently and it is hoped that change of air and scene will complete the cure. The cuts in the original article show the reduction of the exophthalmus by one-half, as well as a slight reduction of the thyroid tumor. The tachycardia was not influenced by the sympathectomy. The case, therefore, is classified as one of "slight improvement."

Sympathectomy has been performed 52 times according to the literature, with 10 or 18.5 per cent. cured and 30 or 58.5 per cent. improved. Many cases of Basedow's disease recovered under hydrotherapy, potassium bromid and hygienic measures. Others are rebellious to all medical treatment. In these cases or when confronted by rapid and serious complications which compromise life or sight, surgical intervention is indicated. Thyroidectomy has not given encouraging results. Gayet asserts that it "whips up the affection;" Poncet writes of the "damage done in some cases and the uncertain results in others," and the general consensus of opinion seems to be that it should be reserved for desperate cases exclusively. The statistics show a mortality of 10 to 17 per cent. according to Wiesinger, Rehn and Stazz. In the present case, the patient was unable to benefit by adjuvant hygienic measures, and her distress at the loss of one eye and the danger to the other, deprived the sympathectomy of physical and moral support on the part of the organism. The improvement attained rendered it possible by the retrogression of the eyeball to protect it by a sufficient covering obtained by tarsorrhaphy and flap-transplantation, thus saving the eye. Tornatola is firmly convinced that he could have saved both eyes if he had done a bilateral sympathectomy earlier. He therefore hastens to publish this case-report to encourage others to resort to sympathectomy in appropriate cases of severe exophthalmic goiter, threatening

life or sight. He encourages surgeons to perform sympathectomy and publish candidly the results obtained. The study of a number of cases will establish the real value of this new method of treatment, the contra-indications and the best methods of intervention. Experiences to date indicate that sympathectomy according to Jonnesco, is the preferable intervention for relieving the goitre and the exophthalmus.

Relations Between the Curvature of the Cornea in Congenital, Regular Astigmatism. Anthropologic Measurements of the Skull and Face According to Clinical Observations.

ALESSANDRO, F. Assistant at the Ophthalmologic Institute of the Messina University. (*Archivio di Ottalmologia*, ix, 1 and 2, p. 1.) Anthropology teaches how to measure the cranium of living human beings and to determine its capacity. By the aid of these measurements we are able to estimate with more or less precision the degree of deformity of the cranium. Deformity of the skull in connection with aberrations in development, is signal evidence of atavistic retrogression. Besides the signs of physical degeneracy, others of a functional or psychic order or both combined, enable us to affirm degeneration. that certain individuals present the evidences of atavistic

Therefore, when we encounter these characteristics of atavistic degeneration, we can assume that the genesis of the organs in question has not followed the normal course of complete development, and that in their functions they are liable to fall short of the normal standard. Mingazzini has well said that "an indication of atavism is a token that the evolution of an organ has not occurred with normal and complete regularity." Boerhaave noticed, as early as 1708, that all children with long heads have a tendency to myopia, thus confirming Mingazzi's statement and the anthropologic fact, commonly observed, that functional or psychic, or functional and psychic characteristics of atavistic degeneration correspond with the physical.

Von Ammon (1841), and Radius and Rieck (1842) called attention to the relations between congenital anomalies of the cranium and those of the eyes. (They and other writers have published reports of cases in which

there was no direct proportion but rather marked contrast between the deformities of the eyeball, orbit and cranium. But these were cases of monstrosities with exaggerated deformity, which, therefore, have no bearing on the subject under discussion.) Landolt in his turn included cranial abnormalities among the causes of ametropia, and Emmert pointed out the interesting information that might be derived from measurements of the cranium and orbit of individuals whose refraction has been determined before death. Almost contemporaneously with Emmert. G. B. Bono published the results of examination of the skull in 200 living persons and in 340 cadavers, determining the relations between the orbit, the cranium and the eyeball, and in the following year he investigated the proportions between the shape of the cranium and the ocular refraction with invariably interesting results. After this he returned to the investigation of the proportions between the cephalic index and the ocular refraction. Doniers, studying the same subject, came to the conclusion that an unusual length of skull, dolichocephaly, favors the production of myopia, and Sormann believes that it can be recognized from the shape of the face. Bourgeois and Tscherning also studied the proportions existing between the curvature of the cornea and the circumference of the skull and height in 210 individuals, reaching the conclusion that the curvature is proportional to the circumference of the head and the height. Continuing the same line of research, Morselli reports that in the insane and those who although not actually insane yet exhibit the stigmata of degeneracy, various congenital anomalies can usually be discovered in the choroid, retina, etc. Besides, and in addition to various congenital anatomical aberrations, and stigmata of degeneracy, all kinds of anomalies refraction are to be observed, such as myopia, hypermetropia and especially astigmatism. This occurs not only in case of congenital anomalies, but, if we accept the same author's assertions, the coincidence of astigmatism, etc., is to be noted also in persons with artificially deformed skulls.

Alessandro made a special study of the proportions between the curvatures of the cornea in regular congenital astigmatism and anthropologic measurements of skull and face, utilizing for the purpose the clinical ob-

servations recorded during 1889 and 1890, and incorporated by G. Mobilio in his thesis. Twenty individuals were examined, including ten with astigmatism and ten with emmetropia. He used the Javal and Schiötz ophthalmometer, 1889 model, to determine the curvatures of the cornea, ascertaining the subjective astigmatism by Donders' method. He found the length of the three radii of the osculating circles which correspond to given points on the cornea, using the ophthalmometer for the purpose. Then applying Helmholtz's formulae for analytic plane geometry to the determination of the corneal ellipse, he obtained the elements of the ellipse of the astigmatic cornea. The results of these researches in regard to the curvature of the cornea in congenital regular astigmatism, will be published later. The anthropologic measurements of the skull and face were taken with the craniometer for the maximum diameter, with a tape measure for the curves, with an adjustable compass with straight legs for the minimum length and diameters, with Broca's goniometer for the facial angle.

The number of subjects examined is not large, and, to complete the research, various other considerations should be taken into account, other varieties of astigmatism, myopia and hypermetropia. But, nevertheless, he considers himself justified in announcing the following conclusions from his studies, in the limits of a preliminary communication. He notes, first, the predominance of mesocephaly, in proportion to the other types of skulls. Among this class the astigmatism was not pronounced in those subjects with a small cephalic index. In one instance, a medium cephalic index corresponded with the maximum of dioptries in the astigmatism. This applies also to anisometropia. In one of the two subjects with brachycephaly, the astigmatism was much more pronounced than in the majority of cases of mesocephaly. The cephalic index in the emmetropic averaged less than in the astigmatic subjects. He found that the circumference of the skull is larger than normal in the astigmatic, and likewise in the emmetropic. The capacity of the cranium is also larger than normal in almost all the astigmatic subjects. The average in the emmetropes was less than in the astigmatic. No anthropologic significance can

be attributed to the fact of the predominance of the anterior semi-curves over the posterior, as the results obtained by various authors are conflicting in this respect. It may be found, however, that the astigmatism is more pronounced in those individuals in whom the difference between the posterior and anterior semi-curve is most marked. This may be explained by Goethe's and Lavocat's theory, according to which the fronto-maxillary veterbra, being the only one connected with the organ of sight, variations in its development may influence the development of the different parts of the eyeball. According to the theory proposed by Goethe and Ohen at the commencement of the last century, the cranium is the most anterior and most advanced portion of the vertebral column, and is constructed of a small number of vertebrae which Ohen describes as the vertebra of the eye, of the ear and of the maxillaries. In the astigmatic subjects examined by Alessandro, Camper's facial angle is smaller than normal, while the facial index and the orbital index are larger. The facial angle in the mesocephalic subjects seemed to be in inverse proportion to the astigmatism. This law also applied to the facial, but not to the orbital index. The measurements of the skull in the astigmatic subjects seemed to deviate slightly from the ordinary type of the region. In the majority, also, the abnormal anthropologic findings were most numerous in the cases of most pronounced anisometropia, but this was not invariably the case. The extreme types frequently approached each other. Physiologic astigmatism is below .75 D. The pathologic may attain a high degree but usually diminishes. The most frequent is between 1 and 3 D. Anisometropia is most frequent and most marked in pathologic astigmatism, which is almost a transition into the physiologic.

Modifications of the Trichiasis Operation. Suprarenal as a Means of Operative Ichemia.

LUCIANO, E. First Medical Assistant of the Milan Ophthalmologic Institute. (*Annali di Ottalmologia*, XXX, 5 and 6 p. 360.) Of the two operative methods generally preferred for the treatment of entropion and trichiasis resulting from trachoma, Ferri, of the Ophthalmologic Institute at Milan, adopts the Streatfield-Snellen operation for cases in which there is much alteration of the tarsus,

while he follows the Jaesche-Arlt. method when the changes in the free border of the lid predominate. Both of these methods have certain disadvantages which Luciano has sought to remedy by a modification of the technique, and the simplification of the operation by preliminary and preventive hemostasis by means of suprarenalin, without mechanical measures. When suprarenalin, the extract of the adrenal glands, is first prepared, it is of a light amber color and is entirely ineffective from the ophthalmologic point of view. After a few days it turns a reddish-brown color and becomes strongly and durably active. This difference in its action, when fresh and after standing a few days, may explain the differences in the results obtained with it. Luciano uses a preparation of the gland in an artificial serum with glycerin, of which 1 gm. of the fluid corresponds to .5 gm. of the gland. To one part of the 50 per cent. solution thus obtained, he adds two parts of a 5 per cent. solution of cocain hydrochlorate. He injects it with a Pravaz syringe along the margin of the lid, at two points, in the middle and outer edge, inserting the needle from the middle of the lid to the internal angle, and then slowly injecting the fluid as the needle is withdrawn. The operation is then repeated, inserting the needle from the outside toward the center of the lid. The tarsal portion of the lid is thus uniformly distended by the injection of about .5 cc. of the mixture. In about ten minutes the operation proper can be commenced with confidence that anesthesia and hemostasis have both been secured, with no necessity for mechanical hemostatic measures. The anesthesia is actually more perfect than with cocain alone, while the ischemia enables the operation to be completed without Snellen's forceps or any measures to obstruct the field of operation. In none of the cases in which it has been used in this way have any inconveniences been observed at the time or afterward. Without this preventive hemostasis, the modification in the operative technique proposed would be impossible, as the hemorrhage would be excessive. A Jaeger plate is introduced between the eyeball and the lid. The lid is then split as for the Jaeger-Arlt operation, with a cutaneous incision in the intermarginal line, separating the muscular layer and the zone of hair follicles from the tarsus and conjunctiva.

A crescent-shaped flap which includes the skin and muscular layer, is then excised on the outer aspect of the lid, opposite the upper border of the tarsal plate. The lower incision for the flap should be about 2 mm. from the margin of the lid, diminishing this distance to increase the degree of correction. The operation is concluded by suturing together the two lips of the wound left after the excision, by drawing up the lower lip to meet the upper, for which it has previously been mobilized by the preliminary incision along the margin, just inside the lashes. But instead of merely suturing the two lips of the wound together, as in the Jaeger-Arlt operation, which frequently results in the tearing out of the sutures in the stretched tissues, the needle is inserted first in the upper lip of the wound left from the excision, and is then passed through the ligament as by Hotz's method, opposite the upper border of the tarsus, and then passed through the corresponding point of the lower lip of the wound. There is no need to fear an excessive correction as cicatricial tissue forms between the lips of the intermarginal wound. It is sometimes advisable to separate them after they have grown together, in order to promote the formation of a stronger band of connective tissue to prevent a relapse. This modification of the technique is practically a combination of the two methods most in use, while it obviates their inconveniences. Permanent correction of the lid is obtained without danger of relapse, without deformity of the free border of the lid and without the falling of the lashes, while the cosmetic results are more than satisfactory.

Holocain as a Local Anesthetic Especially in Ophthalmic Surgery..

RICCHI, GINO. (*Annali di Ottalmologia*, XXX, 3, p. 202.) After extensive and numerous tests on sound and diseased eyes, Ricchi believes that holocain is superior to any other substance as an anesthetic for the eyes. Its trifling inconveniences are far outbalanced by its advantages. Certain persons experience a slight smarting as two or three drops of a 1 per cent. solution are instilled into the conjunctival sac, but this slight sensation lasts only a few seconds. The anesthesia occurs very rapidly. In one and a half to two minutes and exceptionally three, the

sensibility of the cornea is entirely abolished even for the pressure of a bristle that will not bend with less than 3.5 gm. weight. The anesthesia lasts for about ten minutes and gradually disappears by the end of eight to ten more, but by repeating the instillation it can be prolonged for twenty to thirty minutes. As the fluid is instilled, the conjunctival and pericorneal vessels become moderately congested. This congestion subsides in two or three minutes in some persons, and in others, lasts throughout the anesthesia. With a 2 per cent. solution, the congestion and smarting are a trifle more pronounced than with the 1 per cent. It was impossible to obtain complete anesthesia with a 5 per cent. solution. No alterations could be discovered in the eye from the use of either of these solutions. The cornea does not become dry but remains clear and moist, even with the eye uncovered. The tension of the eyeball is not augmented. The accommodation does not vary before and after the instillation by more than .5 D. The antiseptic properties ascribed to holocain are illusory. The lack of stability that has been observed, is only in the color, which turns pinkish in the course of two months, but the anesthetic properties are not affected. The vasodilating action is so slight that there is no more hemorrhage than when cocain is used. The toxic dose for rabbits is 5 to 12 mg. per kilogram and the fatal dose, 5 to 10 cg. Subconjunctival injection of even an entire Pravaz syringe-full did not cause any disturbance in the eyes of the animals except the transient, inevitable chemosis. Ricchi does not recommend holocain in the clinic except in the form of a collyrium, but in this form he is convinced that it is a most valuable aid in ophthalmologic practice.

Permeability to Microorganisms of the Intact Mucous Membrane of the Nose and Conjunctiva, in Relation to Endocular Infection. Experimental Research.

DE BONO, F. P. AND FRISCO, B. (*Archivio di Ottalmologia*, viii, 11 and 12, p. 401.) The skin and mucous membranes of the animal organism have been considered, until within the last few years insurmountable barriers to microorganisms as long as the epithelial coat covering them retained its integrity. Recent researches, however, have deprived this axiom of general pathology of its absolute character, and Flügge, in his book, "Die Microor-

ganismen," published in 1896, cites numerous cases which demonstrate that the skin and certain mucous membranes may allow the passage of microorganisms, even when completely intact. The results of recent researches in this line have been contradictory. Nearly all the investigators assumed as their criterion of the permeability of microorganisms through the nasal or conjunctival mucous membrane, the development of general infection in consequence. They neglected to take into account the various factors which coöperate to prevent general infection in such cases by limiting the dissemination of microorganisms. The lymphatic ganglia of the region, for example, may prove an effectual obstacle to their general diffusion. The function of the ganglia as filters for microorganisms has been recently demonstrated and emphasized by the works of Manfredi and his school in particular. If these factors are not taken into account, it is easy to attribute to the skin and mucous membranes an impermeability and a protection against invasion which in reality they do not possess, and which in fact are due to the peculiar conditions encountered by the microorganisms after they have surmounted the outer barriers. Researches recently undertaken at the Institute of Hygiene at Palermo—from which the present communication proceeds—have established that germs deposited on the intact skin or vaginal mucosa are found soon afterward in the lymphatic ganglia of the respective regions. If the germs are very numerous or so virulent as to overcome the resistance opposed by the ganglia, general infection may result. If not, there is merely a local reaction on the part of the ganglia, which become tumefied and undergo various modifications in their structure, proportional to the number of germs which reach them. These facts have been demonstrated by researches still in progress and not yet published. No research of the kind has yet been undertaken in respect to the buccal, pharyngeal, nasal and conjunctival mucous membranes, for which, as for the vaginal mucosa, the assumed impermeability has been variously ascribed to the action of the secretions and the protection afforded by the epithelium. Continuing his research on the behavior of the eye in experimental infections, part of which has been already published, Bono and Frisco have

endeavored to discover whether microorganisms deposited on the nasal and conjunctival mucous membranes, are able to penetrate into the interior of the eye before entering the general circulation, and whether endocular infection is possible without a solution of continuity in the outer envelop of the eyeball. On account of the anatomic construction of the eyeball, if the germs succeed in penetrating through the mucosa, they can be discovered in the interior of the eye before they pass into the general circulation. In order to prevent any possible interference with the experiment, the lumen of the naso-lacrimal canal was obliterated with the thermocautery, and the experiments were not commenced until cicatrization was complete. Everything was scrupulously avoided that could interfere with the absolute integrity of the conjunctiva of the rabbits in the test. The emulsion of the cultures used was instilled from a graduated pipette without touching the tissues. The lids merely opened with the fingers and allowed to close at once after the instillation, which was done under anesthesia with Richet's mixture injected into. Ten minutes to two hours after the instillation, the conjunctival sac was delicately flushed with sterile water, and the aqueous and vitreous humor were aspirated, each with a separate pipette, first thoroughly cauterizing the surface where the aspirating needle was to be inserted, in order to avoid contamination from germs still clinging to the conjunctiva. The microorganisms used in the tests were the pyocyaneus, the prodigiosus, the staphylococcus aureus, the anthrax and the tubercle bacilli. Plate cultures were made of the aspirated fluids. In case of the tubercle bacillus, guinea-pigs were also inoculated.

The results of the experiments were positive in 17 out of 21 tests, which included all of the animals in which contact with microorganisms had lasted from one to two hours. The results were negative in the experiments in which the duration of contact had been merely ten minutes to one hour. The anthrax bacilli seemed to experience the greatest difficulty in penetrating into the eyeball, judging from the small number of colonies which could be derived from the aspirated fluids. It is worthy of note that none of the animals died of general infection, notwith-

standing the virulence of the germs employed. Those animals alone which had been instilled with anthrax bacilli, became emaciated and their hair fell out. Similar tests with other rabbits in which the microorganisms were placed on the nasal mucous membrane both with and without obliteration of the naso-lacrimal canal revealed the same penetration of the germs into the aqueous and vitreous humors of the eye on the same side. None of the animals exhibited any signs of general infection. One or two colonies, at most, could be derived from the blood in the heart, from the liver, spleen and lymphatic ganglia of the neck and occasionally from the anteaauricular, submaxillary, deep jugular and carotid lymphatic ganglia. This fact, considered in connection with the presence of large numbers of germs in the aqueous and vitreous humors and the absence of general infection, authorizes the conclusion that the bacteria penetrated directly into the eye from the nasal and conjunctival mucous membrane, and that they also arrived secondarily in the eye in the blood, but reduced in numbers and virulence, by the route described in these writers' previous communication. Part of the germs were retained by the ganglia connected with the anterior lymphatic vessels of the eyeball and its appendages. In further instillations of India ink, it was possible to trace the exact route followed by the particles from the conjunctival lymphatics along Schlemm's canal into the anterior chamber and hence into the vitreous. From the lymphatics of the nasal mucosa, the particles passed into the ethmoid cells and the lamina papyracea, thence into Tenon's capsule and thence into the eyeball. The practical results of these researches are particularly important in the pathology of the eye. In the much discussed question of the pathogenesis of sympathetic ophthalmia, cases have been cited of the appearance of this affection in consequence of lesions of the sclerotic without involvement of the conjunctiva which covered the lesion in the sclerotic completely, even in cases of subconjunctival rupture of the eyeball. The comparative benignity of these injuries has been emphasized, and it has been interpreted as evidence that the intact conjunctiva prevents the entrance of bacteria from without. But, on the other hand, a certain

number of cases of sympathetic ophthalmia have been accumulating in literature in which lesions of this kind had been noted. Schirmer, in his valuable work on sympathetic affections of the eye, refers to twenty-seven cases of this character. Excluding those in which there is a possibility of doubt, he is able to cite eleven cases in which sympathetic ophthalmia with intact conjunctivae was beyond all question. In order to explain the infection in these cases, some imperceptible lesion of the conjunctiva has been supposed or infection through a cicatrix or an endogenic infection, in which case naturally, the injury of the eye first affected would have merely secondary importance. The possibility, demonstrated by the researches described in this communication, of the direct penetration of microorganisms through the intact conjunctiva, indicates the absolute integrity of the conjunctiva in these and similar cases, and discloses the possibility of another route for the infection, both for sympathetic ophthalmia and for other unilateral endocular affections, difficult to explain by an endogenic infection. Thus, for example, the rare cases of primary tuberculosis of the iris, which hitherto have been accepted as of endogenic origin, may be due to exogenic infection by this mechanism and route. The experiments of Tangl, who established that tubercle bacilli instilled into the intact conjunctival sac, are not capable of inducing general tuberculosis, do not conflict with this assumption. The result of the researches on the nasal mucosa are of still greater importance. The relations between nasal affections and diseases of the eyes have been frequently noted. Daily clinical observation corroborates the coincidence, if not the dependence, of various kerato-conjunctival affections with eczema or other affections of the nasal mucous membrane. Seifert has recently called attention to the frequent coincidence of corneal ulcer with atropic rhinitis. De Cherbourg observed a serous iritis which at first seemed to be connected with dysmenorrheic disturbances, but which persisted in spite of treatment instituted on this supposition. It did not yield until he applied treatment to a fetid rhinitis on the same side. As the latter was cured, the iritis vanished with it and has shown no signs of recurrence to date. Another article interesting from this point of view, has been published

lately by Senn and Spirig on the coexistence of chronic irido-choroiditis with a fetid rhinitis or rhinopharyngitis. They noted this coincidence in fourteen out of twenty-one cases. Senn also noticed that exacerbations of the ocular process coincided with an aggravation of the nasal affection, while appropriate treatment of the latter had a manifestly favorable influence on the irido-choroiditis. Spirig endeavored to discover the link uniting the two affections which thus clinically displayed the intimate relationship between them. He obtained negative results in examination of the aqueous humor and consequently denies the possibility of migration of microorganisms ascending the nose to the eye. He suggests that the ocular affections may be due to the transmission of toxins. De Bono has a case under treatment now in which the origin of the irido-choroiditis as well as the course, seems to be intimately connected with a coexisting rhinopharyngitis. Dermatologists are convinced that the primary manifestations of lupus of the face and of leprosy, occur in the nasal mucous membrane, and it is quite probable that the frequency of leprosy manifestations in the conjunctiva, cornea and iris, as well as those of the deeper portions of the eyeball, and especially those rare cases, like that described by Albertotti in which the appendages and region surrounding the eye remained immune, are due to this method of penetration of the germs from the nasal mucosa. Hence the determination of the fact that microorganisms deposited on the nasal mucosa may penetrate into the interior of the eyeballs provide a solid experimental foundation for the occurrences observed daily in the clinics, and may even justify Ziem's hypothesis in respect to the possible origin of sympathetic ophthalmia from the nose and adjacent fossae.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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(Quarter Ending September 30, 1901.)

Ocular Troubles in Acute Meningitis. Paralysis of Eye Muscles with Concomitant Retinal Lesions.

TEILLAIS, Nantes. (*Annales d'Oculistique*, August, 1901.) The patient seen by Teillais was an unmarried woman of twenty-four years of age. Three years before she came under the author's care she had had typhoid fever, this having been complicated with a temporary incomplete palsy of the oculo-motor nerve.

Three months previous to the author's seeing her she suffered from a severe meningitis which was apparently idiopathic in type. Palsy of the third and fourth nerves of one side, with an associated reduction of vision to the ability to perceive light, followed the attack. The ophthalmoscope revealed a hazy condition of the vitreous humor. Treatment consisted in hypodermic injections of strychnia and the internal administration of iodid of potassium, combined with local applications of the faradic current. In two months' time the ocular symptoms were improved. A onesided mydriasis had disappeared, and the acuity of vision had arisen to one-fortieth of normal. The inner portion of the visual field was lacking and there was a central scotoma. There was diplopia. The vitreous humor was so much clearer that it was possible to distinguish a grayish mass which elevated the retina.

A month later a ptosis appeared. The motor nerves were still gaining power, and vision had arisen to one-fifteenth of normal. The scotoma had disappeared. The optic nerve head could be clearly distinguished. The retinal vessels were almost completely hidden from view.

The author believes that he had to deal with a peripheral lesion provoked by an acute attack of basilar meningitis. This, he says, was the starting point for an infective process, the propagation of which, toward the membrane of the eye, was affected through the sheath of the optic nerve. He thinks that the paralysis of the third and fourth pairs of nerves is more difficult to explain. He asserts, however, that these paralytic phenomena, "which are incontestably of peripheral origin," were most probably due to compression by some meningitic exudate situated at the sphenoidal fissure.

On the Agents which Influence the Degree of Corneal Astigmatism After Cataract Operation.

MAJEWSKI, Cracow. (*Annales d'Oculistique*, August, 1901.) One hundred and forty-one cases have been studied in this report. Unfortunately, this number was examined only once, as many of the cases drifted away from the clinic after the operation, and were not seen again. Those that could be examined several times were studied with the greatest care. Time, Majewski says, is the greatest physician in all of these cases, he having found that a lapse of a few months from the time of the operation reduced to a most remarkable degree, even the highest grade of astigmatism. His findings show that the more peripheral the incision has been made, the greater is the corrective astigmatism. He is uncertain whether a conjunctival flap has any influence or not upon the amount of astigmatism, but he thinks that it is probable that it reduces it. Loss of vitreous humor, hernia of the iris, and a grooved scar, all, he believes, probably increase the error of refraction. He has determined that the age of the patient is a factor in the production of the corneal fault, he having found the trouble higher in subjects above sixty-five years of age than in those who were younger. The combined operation, he says, has made a better showing than the simple form of extraction. The meridian of greatest curvature of the cornea, he estimated, is nearly

always parallel with the line of the incision; but he has found that it is not always situated at right angles to the median of least curvature. In certain cases the astigmatism was found to be absolutely irregular. In one instance, the corneal error, measured thirteen days after the operation, reached the high degree of thirty-one diopters, but in time was reduced to nineteen and a half diopters. He accepts the belief of Weiss that the flattening of the vertical meridian is due to an overriding of the corneal flap upon the peripheral one.

On the Diagnosis of Tubercular Affections of the Visual Apparatus.

MORAX and CHILLOUS, Paris. (*Annales d'Oculistique*, August, 1901.) These authors state that there are two available methods of making an exact diagnosis in such cases: These are by the inoculation of one of the lower animals, and the injection of Koch's tuberculin into the subject.

They have found that the guinea pig is a better animal than the rabbit to employ for inoculative purposes, as it yields more rapidly and certainly to the effects of the bacillus: the latter not infrequently absolutely resisting these germs. For injection, they employ about one milligramme of Koch's tuberculin. This, they say, should be injected only after carefully ascertaining that there are not any foci of tuberculosis in any part of the body; they having found that under such conditions the reagent is harmless and at times exerts a therapeutic effect upon the disease.

The Role Played by the Degree of Alkalinity of the Humors of the Eye in the Pathogeny of Panophthalmitis.

DOR, LYONS. (*Revue Generale d'Ophthalmologie*, June 30, 1901.) By using the alcoholic solution of phenolnaphthalin, Dor has demonstrated that the normal reaction of the aqueous and the vitreous humors is acid. Moreover, he has found that this reaction is more marked in healthy than in diseased eyes. Reasoning from this he comes to the conclusion that any lessened acidity is due to an effect on the part of the eye to render the tissues alkaline in order to overcome bacterial growth. Experiments made with rabbits inoculated with pus germs tended to show him that large doses of an alkali (especially iodid of potas-

sium) given before or at the time of inoculation, tended to either reduce any virulence or prevent infection of the organ.

His conclusions are as follows:

1. Iodid of potassium administered the day before prevents the appearance of any inflammatory phenomena in the eye of an animal that is inoculated with a culture of staphylococcus pyogenes, provided that the quantity of the culture that is injected does not greatly exceed the dose that is necessary to produce a panophthalmitis in a control animal.

2. Iodid of potassium administered the day before greatly reduces the progress of a panophthalmitis that is produced by the inoculation of a larger dose of the culture.

3. When a small dose of the culture is used, it is possible to prevent the appearance of panophthalmitis in a rabbit by administering the drug within a few hours' time after the inoculation.

The Technique of Muscular Advancement.

LANDOLT, Paris. (*Archives d'Ophthalmologie*, July, 1901.) This last contribution from Landolt is of particular interest from the description he gives of certain refinements in the method of operating which he has evolved. His speculums are made to turn so that the instruments may rest toward the nose or toward the temple. The hooks which separate the lids are held by a bar passing along the skin surface instead of the conjunctival surface of the lids. The arms of the instrument are clamped by a lever instead of a screw, thus rendering their manipulation much easier. The pairs of forceps employed are: a pair of fixation forceps with a clamp and a pair of forceps with oblique teeth. The strabismus hook is slightly flattened and is olive tipped. The needle holder has a sliding catch, and the needles, which are curved, must, he says, have perfect points. The suture threads are black and white, in order that they may be readily distinguished. Two pairs of scissors are necessary, one that is slightly curved with blunt points, and the other a curved one with sharp points. He has found that unless operating on a child or a very nervous patient, the instillation of cocain produces sufficient anesthesia for the procedure.

The conjunctiva is lifted close to the cornea and by

means of the scissors, a flap running back to the point of the insertion of the muscle upon which the operation is to be performed, is excised, taking care to include the tip of the flap in order to avoid puckering. The eye is forcibly rotated in the opposite direction and the muscle is seized close to the edge that is nearest to the operator. A nick is made in the capsule of Tenon a little to the same side of the muscle. The sclerotic should be made to appear through this cut. The hook is then introduced through this opening and passed beneath the muscle. If instead of passing beneath the muscle it should penetrate the muscle substance, another hook may be introduced through a new nick made in the capsule, opposite to the first. The hook first introduced may then be withdrawn. The hook is held by an assistant and the sutures are passed from without inward, one above and one below in such a way as to allow about the distance of one-third of the width of the muscle to separate them. They are made to pass through the cellular tissues, the capsule, and the muscle.

If but a limited effect is desired, the sutures can be passed in front of the hook. If it is necessary to resect a part of the muscle, the sutures should be made to pass under it, coming out behind it. The end of the suture that is to pass to the ocular side should include the episcleral tissues and the conjunctiva; and if this does not afford sufficient anchorage, the suture must be again passed into the conjunctiva at a new point further along. Both eyes are to be bandaged and the patient should be placed in bed in a quiet well-aired room. The dressings are to be changed every day. In case of convergent strabismus a drop of atropin is to be instilled. The sutures should be removed on the fifth or the sixth day. In divergent strabismus, the bandage can be removed at the end of this time; but in the convergent form of strabismus, the bandage is to be allowed to remain for one or two days longer, when it should be replaced by a pair of smoked correcting lenses. If there is a tendency to a reappearance of a convergence, atropin should be continued and the correcting lenses worn. If the trouble has disappeared, the drug can be stopped; although at the least, a manifest correction must be worn for near work. An over correction can be reduced by discontinuing the use of both the atropin and

the glasses. Binocular vision is the greatest desideratum, and the employment of a stereoscope is a very important adjunct in promoting this desired for effect.

Sub-Conjunctival Injections of Hetol.

PFLUGER, Bern. (*Archives d'Ophthalmologie*, July, 1901.) Pfluger has found that hetol or cinnamomic acid is of great use in cases of herpes and deep ulcerations of the cornea, anterior uveitis, parenchymatous keratitis, and rebellious scleritis. For its employment, he injects from four to five cubic centimeters of a one per cent. strength solution of the drug every other day. In addition, the patient is taught to make light massage upon the eyeball for a few minutes' time. No dressings are necessary. The pain is very slight and temporary.

A Case of Enormous Congenital Excavation of the Optic Nerve Head.

TERRIEN AND PETIT, Rouen. (*Archives d'Ophthalmologie*, July, 1901.) The patient, seen by Terrien and Petit, was a girl of 19 years of age. Her family and personal histories were negative. She complained of asthenopia during near-work with headaches that appeared at any and all times. The left eye deviated inward and slightly downward; its upward rotation was limited. If the right eye converged, the left eye deviated outward. There was an excavation of the right optic disc of about eight millimeters' depth. The nerve head was surrounded with a ring of atrophied choroid. The visual field showed a contraction for white and other colors, in conjunction with a large scotoma situated at the point that is usually occupied by the blind spot. The eye was myopic in its refraction. The condition was ascribed to a fault of development.

BOOK NOTICES.

Notes on the Eye, for the Use of Undergraduates.

Frank Laramore Henderson, M. D. (Professor of Ophthalmology in the Barnes Medical College, St. Louis, Mo.; Ophthalmic Surgeon to the St. Mary's Infirmary, the Centenary Hospital and the Christian Orphans Home; Consulting Oculist to the Wabash Railway, and to the Terminal Railway Association; Member of the American Medical Association; Member of the Missouri State Medical Association; Vice-President of the Missouri State Medical Society, and Secretary of the St. Louis Medical Library Association. Second Edition, 1900; Nixon-Jones Printing Co., St. Louis, Mo.)

Is a 151 page book, taking up the anatomy, principles of refraction and physiology, diseases of the ocular apparatus, from diseases of the lids to diseases of the optic nerve, in 23 short concise chapters, the last chapter being upon functional disorders of vision. The book is profusely illustrated with good wood cuts taken from various authors, which fully carry out their intent in illustrating the text. As the author states in the preface, his only claim to originality for this work lies in its omissions. Minute anatomy, optics, the fitting of glasses, skiascopy, ophthalmoscopy, and kindred subjects have been left out intentionally, as he believes they belong to postgraduate instruction. Diseases which have to be diagnosed by the ophthalmoscope are also slighted as he believes the diagnostic value of the ophthalmoscope is not great in the hands of the general practitioner and students for which this book is designed. Its abstract conciseness and general to-the-pointedness will recommend it to whomever has use for a thorough outline of fundamental ophthalmology.

NELSON M. BLACK.

Manual of the Diseases of the Eye for Students and General Practitioners.

May, Charles H., M. D. (Chief of Clinic and Instructor in Ophthalmology Eye Department Col. of Physicians and Surgeons Med. Dept. Columbia University, New York. With 275 original illustrations including 36 colored figures; Second Edition, Revised. Published by Wm. Wood & Co., New York, 1900. Price——)

The second edition of this little book was reviewed in the ANNALS, Vol. IX No. 4, p. 718. The revised second edition has a number of alterations and the number of illustrations and color plates has been increased materially. Most of the additions to the text have been in the paragraphs on acute catarrhal conjunctivitis and in the chapter on ocular therapeutics. In the latter chapter, the same "glaring defect" remains as noted by the previous reviewer, i. e., the use of the apothecary system of weights and measures in-

stead of the metric system. The book, in all other respects, holds its own in the class of text-books it is meant to represent.

NELSON M. BLACK.

Saunders' Question-Compends. No. 14.—Essentials of Refraction and of Diseases of the Eye with a Consideration of Ocular Injuries and the Ocular Symptoms of General Diseases.

Jackson, Edward, A. M., M. D. (Emeritus Professor of Diseases of the eye in the Philadelphia Polyclinic; formerly Attending Surgeon to Wills' Eye Hospital, Philadelphia; Ophthalmologist to the Arapahoe County Hospital, and Consultant in Ophthalmology to St. Anthony's Hospital, Denver. Third Edition, Revised and Enlarged. 82 Illustrations; W. B. Saunders & Co., Philadelphia and London. 1901.)

The place that Saunders' Question-Compends holds in the hearts of students and those preparing for examination for appointments in the Army, Navy and before State and other Medical Boards is unrivaled. The standard was set many years ago and the compends have increased in superiority and merit with each edition. In this little book, the questions are tersely asked followed by the answer written in an interesting and instructive manner, making it pleasurable reading as well as instructive. These compends cannot be recommended too highly for those preparing for examinations, etc.

NELSON M. BLACK.

Ophthalmology and Ophthalmoscopy.

Dr. H. Schmidt-Rimpler, Professor of Ophthalmology, Privy Counsellor and Director of the Ophthalmiatric Clinic at Halle a. s. (Augenheilkunde und Ophthalmoskopie fuer Aerzte und Studierende). 7th improved edition, with 190 wood cuts and 2 colored plates. Leipzig, 1901, S. Hirzel. 12 Mark, \$3 00.

The new edition of this well known and well liked text book of the celebrated author has been remodeled and enlarged according to the progress of ophthalmology up to date. Especial care has been devoted to bacteriology, and a new chapter on the injuries of the eye and the valuation of economic damage caused by them has been added. The general conditions in relation to changes of the visual organ are enumerated in the alphabetic index, thus avoiding numerous repetitions in a special chapter. The book has chiefly a didactic purpose and is written in a form which greatly facilitates the study of ophthalmology.

C. ZIMMERMANN.

Relation of General and Organic Diseases to Changes and Affections of the Visual Organ.

A. Groenouw and W. Uhthoff, Professors at Breslau. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd edition newly written, with illustrations, chapter XXII, Vol. XI, part 1, by A. Groenouw, No. 28, Leipzig, 1901, Wm. Englemann. 2 Mark, 50 cents.

The first part of this chapter has been reviewed in the July No.

Now follow the relations of the sexual organs to the visual organ: gonorrhoeic and metastatic conjunctivitis and iritis, photopsia and obstinate conjunctivitis from masturbation and sexual excesses. The largest portion of this No. is devoted to the visual disturbances from affections of the female sexual organs, although we are able to prove such a dependence beyond doubt only in a small number of cases in most we must be satisfied with the possibility or probability of it. Thus G. opposes Mooren who attributed the majority of ocular affections in women to genital diseases. Many observations however, show that the influence of the latter on the former cannot be decided. It is mostly due to reflex irritation of the sensory and vasomotor nerves and alterations of bloodpressure, quantity and quality of blood during menstruation. Since the latter occupies about one-fourth of a certain time of life it is natural that the commencement or the exacerbation of a disease must fall into the period of menstruation without any causal connection whatever. It only may become probable if such a coincidence recurs repeatedly in succession, as edema of the lids and conjunctiva, anthopsia, etc. The diseases of the optic nerve from disturbances of menstruation and diseases of the uterus are exhaustively discussed, as well as kopiopia hysterica, and the ocular affections observed during gravidity, labor, puerperium and lactation, of which neuritis and atrophy of the optic nerve play the most important part. The last paragraphs deal with the injuries of the eyes of the child during labor, the metastases of malignant tumors of the genital organs in the eye and the diseases of the genital organs subsequent to ocular affections.

C. ZIMMERMANN.

Macroscopic Anatomy of the Eye.

F. Merkel and E. Kallius, Professors at Goettingen. Graefe-Saemisch, *Handbuch der gesamten Augenheilk.*, 2nd edition, newly written, with numerous illustrations. Part 1, chapter 1. No. 29 and 30. Leipzig, 1901, W. Engelmann. Subscription 4 Mark, \$1.00.

This No. contains the macroscopic anatomy of the eye as far as the nerves. It has been rewritten by the same author, in conjunction with Prof. Kallius, and is increased so far by 47 pages, with the addition of 11 new wood cuts, some of which are colored, e. g., curves representing the growth of the brain and the eyeball, etc. Like the preceding, this chapter shows how indispensable the magnificent handbook is to every ophthalmologist.

C. ZIMMERMANN.

Introduction of Ophthalmology.

Prof. Dr. J. Hirschberg, Berlin. *Einfuehrung in die Augenheilkunde. Zweite Halfte, erste Abteilung.* Mit 113 Figuren und einen Titelbild. Leipzig, G. Thieme, 1901. 9 M., \$2.25

Who ever is familiar with the first half of Hirschberg's work, which came out in 1892, will be delighted with the appearance of the long hoped for first part of the second half. It is preceded by corrections and additions to the first half, and contains on 249 pages the theory of the ophthalmoscope, its practical application, the various forms of instruments, its magnifying power, direct examinations.

visual field of the ophth. images, sources of light, examination of the refraction media, focal illumination, topography of opacities, examination of cornea, iris, lens, vitreous, the objective test of refraction and the objective calculation of the antero-posterior distances.

The characteristic feature of the book is its originality. The subject matter is treated very clearly and exhaustively, but more in the shape of a monograph than of a text book, as we find many important observations elucidated for which we look in vain in the manuals. The style is very precise and enlivened by the frequent interspersing of historical, etymological and critical remarks. Thus the interest of the reader is constantly fascinated, who will read and again read it with the greatest pleasure and benefit. The colored plate, the numerous figures in the text, print and paper are excellent. We anxiously hope that the second part will be published soon.

C. ZIMMERMANN.

The Ophthalmoscope.

A Manual for Students, by Gustavus Hartridge, F. R. C. S., London. With 65 illustrations and four plates. Fourth Edition, Philadelphia, P. Blakiston's Son & Co., 1901. Small octavo, 148 pages, price \$1.50.

This is practically a companion to the same authors "Refraction of the Eye" even now popular among students and practitioners. There are 11 chapters. Starting with the optical principles of the ophthalmoscope, and after discussing the instrument and methods of examination, carrying the reader through descriptions of the normal and abnormal fundus, with details about the cornea, iris, etc.

When I say that there is nothing new in the book it is not the intention to criticise it adversely as a neophili; on the contrary, the statement is rather praiseworthy, for the author has not attempted to introduce or to advocate new methods, nor to treat us to startling disclosures about vexed points. It is such a book as the beginner or casual observer needs to tell what to see, and how to see it. I was at first tempted to object to the scant space allowed to retinoscopy, as well as to his evident preference for the concave mirror, but on further thought I am sure that his mention of retinoscopy is enough for a book on the ophthalmoscope. The retinoscopic mirror is not the ophthalmoscope, and its critical study belongs in a treatise on Methods of Estimating Refraction.

The language is usually clear and precise, though occasionally a lapse from elegant English may be found. I am sorry that *aphakia* is not mentioned, and that therefore the simpler tests by means of the Purkinje Sanson images is not explained. It is often important to discover whether the lens is there and where it lies, but Hartridge does not help us.

The book is a safe guide for one who wishes a Manual, but, except that it condenses its subject into systematic form free from extraneous matter, it contains only what is offered by a thorough text book of ophthalmology.

A. B. HALE.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas, City, Mo.)

Dr. Schiotz will be professor at Christiana.

Dr. George Abelsdorff has taken up his residence in Berlin.

Professor Schweigger was 71 years of age 29th of September last.

Dr. Leopold Javal has been made an officer of the Legion of Honor.

Professor Axenfeld, of Rostock, will succeed Professor Manx at Freiburg.

Dr. A. M. Berger, the well known oculist, died at Munich, April 17th, 1901.

Mrs. Harriet Bacon Smith has bequeathed \$10,000 to the Brooklyn Eye and Ear Hospital.

Drs Würdemann and Black have moved their offices to 105 Grand avenue, Milwaukee, Wis.

Privat Doctent, Professor Peters of Bonn will go to Rostock in succession to Professor Axenfeld.

Mr. Charles H. Hayden, of Boston, has left by will \$50,000 to the Massachusetts Eye and Ear Infirmary.

Dr. George A. Fleming has been made Demonstrator of Ophthalmology in the University of Maryland.

Dr. A. A. Hubbell, of Buffalo, has resigned his position as associate editor of the Buffalo Medical Journal.

Dr. S. F. W. Harvey has been appointed one of the Ophthalmic Surgeon at the Royal Victoria Hospital, Montreal.

Dr. C. Zimmermann, of Milwaukee, has returned from Europe where he spent several months in hospital work.

Dr. S. Baudry has received the appointment of professor at the Ophthalmological Clinic in the University of Lille.

Dr. C. W. Langeman has been elected professor of ophthalmology at the Cincinnati College of Medicine and Surgery.

Dr. S. Lewis Ziegler has been elected Attending Surgeon to the Wills' Hospital, vice Dr. Geo. C. Harlan resigned.

Dr. E. B. Heckel has been appointed associate professor in diseases of the eye and ear, at the Western University of Pennsylvania.

An Ophthalmologic Society was formed in Copenhagen in October of last year. Professor Bjerrum is president and Dr. Lundsgaard is secretary.

The British Government is about to establish a Bacteriologic Laboratory in India under the charge of Dr. Haffkine. It will be located at Parel.

Dr. de Lapersonne has been appointed to the Chair of Ophthalmology, in the Paris Faculty of Medicine, in place of Professor Panas who has resigned.

Dr. McCluney Radcliffe has been elected Attending Surgeon to the Wills' Hospital, Philadelphia, to fill the vacancy caused by the resignation of Dr. John W. Croskey.

At the annual election of the Ophthalmological Section of the New York Academy of Medicine, Dr. John E. Weeks was elected president and Dr. Henry H. Tyson, secretary.

The Chicago Eye, Ear, Nose and Throat College have provided for a number of free beds for charity cases, as the demand for the beds is large, arrangements for same should be made in advance.

The next meeting of the American Medical Association will be held at Saratoga. Dr. Frank Allport, of Chicago, is Chairman and Dr. C. A. Veasey of Philadelphia, Secretary of the Ophthalmological Section.

Dr. Nelson M. Black, of Milwaukee, has gone on a tour of the European clinics. He will visit London, Edinboro, Glasgow, Dublin, Paris, Berlin, Vienna, Moscow, St. Petersburg, Rome and other principal cities.

Dr. Howard F. Hansell, of Philadelphia, has reported in American Medicine (Sept. 14, 1901), a case of ancylostomiasis giving a description of the changes in the eye grounds. The report is very interesting and full, including a blood count.

On the 23rd of July, 1901, Santos Fernandez, a distinguished ophthalmologist of Havana, was presented by the Medical Society of Cuba with a gold medal, commemorative of his services as president of the Third Pan-American Medical Congress.

Alleged Discovery of the Bacillus of Syphilis.—In a paper by Drs. Louis Julien and Justin Delisle, read before the Paris Academy of Medicine on July 3, the writers claim that they have discovered the true bacillus of syphilis.—New York Medical Record:

A death from ether anesthesia occurred in July at one of the New York eye hospitals in a child of three years, while undergoing an operation for strabismus. The child had been etherized about a month previously without any unfavorable symptoms appearing.

An Egyptian Medical Congress is to be held at Cairo under the patronage of the Khedive, December 14, 1902. The president of the congress will be Dr. Abbati Pacha, and the secretary Dr. Vozonoff.

The Ophthalmic Section will be under the presidency of Dr. H. Milton.

Dr. Samuel Theobald, of Baltimore, has described in the *American Journal of Ophthalmology*, a very admirable iridectomy scissors, with which by the curve of the instrument it is next to impossible to so excise a portion of the iris as to leave any part of the resulting coloboma edge engaged in the wound.

Dr. George F. Suker, formerly of Toledo Ohio, has opened an office in Chicago. The Doctor went to Chicago to accept the chair of Clinical Ophthalmology in the Post Graduate Med. School and a Clinical Instructorship in Ophthalmology in the College of Physicians and Surgeons, Med. Dept. of Univ. of Ill.

Dr. Adolf Alt, of St. Louis, has published a monograph "Original Contributions Concerning the Glandular Structures Appertaining to the Human Eye and its Appendages" with 71 original photo-engravings. This book, as the author states, is the result of the author's long continued researches in a still somewhat unknown field.

The Royal Victoria Hospital of Montreal is publishing the results of a series of studies—the first number being in "The Primary Intradural Tumors of the Optic Nerve: Fibromatosis Nervi Optici." By Dr. W. Gordon M. Byers, Assistant Oculist and Aurist, Royal Hospital. Demonstrator in Ophthalmology, McGill University.

The Latin-American Medical Congress.—The first congress, at which a permanent organization was effected, was held in January of the present year in Santiago de Chile. The second will be held in Buenos Ayres, April 3-10, 1904, at the same time as the Fourth Pan-American Medical Congress. The committee on organization of the congress consists of Dr. Emilio R. Conti, President; Dr. Robert Wernicke, Vice-President; Dr. Gabriel Carrasco, Treasurer, and Drs. Gregorio Araoz Alfaro and Nicolas Repetto, Secretaries. —*New York Medical Record*.

Dr. E. A. Shumway sends the following report of the case on "Carcinomatous Degeneration of a Papilloma of the Conjunctiva," which appeared in the July *ANNALS*, p. 388: In a foot note Dr. Risley stated there had been no recurrence up to June, 1901. We find that unknown to Dr. Risley the patient returned and was referred to another surgeon at the Wills' Hospital where he was operated upon for a recurrence of the growth in the orbital tissue. Dr. Risley had been receiving postal cards from another patient in regard to his freedom from recurrence, and had confused the two cases.

At the annual meeting of the Pennsylvania State Medical Society, held at Philadelphia, September, 24, 25, 26, 1901, Dr. S. D. Risley read a very interesting paper "On Some of the Ocular Affections of Childhood Associated with Impaired General Nutrition." Dr. Risley stated that the influence of nutritive defects upon eye conditions may produce changes which can only be recognized by ophthalmoscopic examination combined with tests as to visual fields, etc. He

mentioned two cases, in both there was evidence of malnutrition—headache, etc., and in both there were fundus changes, each case entirely recovered under proper treatment. Dr. E. Stieven, of Pittsburgh, reported a case of Gumma of Ciliary Body. And Dr. S. Lewis Ziegler, of Philadelphia, read a paper on the contagious diseases of the ear.

Miss E. F. Black, of Los Angeles, Cal., has invented an apparatus which enables blind persons to write with ease and satisfaction; it is the most unique invention of the sort in this country; it commends itself to anyone who sees it and is being highly recommended by the medical profession to those who are blind or have eye trouble. The operator can use either a fountain pen or pencil. It has an automatic spacing device which makes it impossible to write one line on another; this device also forms a hand rest, and a spring holds the pen or pencil on the line until the writer desires to make the lower loop letters, when, by pressing the spring down, the writer makes the loop and releases the pressure when the pen is pushed into the proper place.

Syphilis as Seen by the Ophthalmic Surgeon.—Dr. F. Buller of Montreal in commencing his paper expressed the hope that it would elicit a little discussion. It often falls to the lot of the ophthalmic surgeon to discover the presence of active syphilitic virus where the disease had long since been considered cured or when the subject cherished the belief that there was no more to fear from it. The ophthalmic surgeon is scarcely, if ever, called upon to treat the disease in the primary stage. The largest share of his work is in connection with the tertiary period, and in this class of cases the disease has been apparently cured for a long period of time. Dr. Buller considered that the time at which the syphilitic lesion makes its appearance is always a very important element in the diagnosis. Discussing medication the speaker did not believe that the protiodide of mercury, at least as ordinarily administered, is a reliable anti-syphilitic. He appeared to favor the inunction method first, and then the administration of grey powder.—Proceedings of Canadian Medical Association, New York Medical Record.

Methyl Alcohol Blindness.—Among the toxic substances having a selective affinity for the visual apparatus, methyl alcohol is now beyond a doubt deserving of decided recognition, not only from a toxicological standpoint, but from one of prophylaxis. The case of blindness from drinking methyl alcohol, that had been taken under the supposition of it being cologne spirits, as reported by Dr. Harold Gifford, of Omaha, in the Ophthalmic Record, July, 1901, is an indication that all packages containing methyl alcohol should be marked "Poison." The subject, while it is no longer a novelty in ophthalmic literature, sounds a warning note to the medical profession that in all cases of sudden blindness of obscure origin, this substance should be thought of. It is not uncommon for those addicted to alcoholic beverages to procure the "next best thing" when in a locality that supplies no alcoholic drinks, and the danger to

sight and even life requires that precautionary measures be observed. The case reported by Dr. G. E. de Schweinitz, of Philadelphia, in the *Ophthalmic Record*, June, 1901, shows that the pathway of entrance of the poison may even be by the lungs and cutaneous surface.—*Philadelphia Medical Journal*.

The Retirement of Mr. G. Anderson Critchett.—In comment on the retirement from the Ophthalmic Department of St. Mary's Hospital, London, of Mr. G. Anderson Critchett, the *hospital Gazette*, after recording his wonderful ability as an operator and a practical oculist, mentions many of the social qualities that endeared him to his colleagues. His keen sense of humor is illustrated by the following story by Mr. John Griffith: A man having been jammed in a traction engine, was brought to the hospital and admitted. As he was suffering from diplopia, Mr. Critchett's advice was sought. Discovering a paralysis of one of the ocular muscles, he gave him large doses of potassium iodid. The house surgeon wished to try galvanism. After a few weeks the paralysis was cured, and the diplopia had vanished. The house surgeon asked Mr. Critchett which treatment he thought had cured the diplopia. Mr. Critchett said, "I think we might cry 'honors easy,' for I took him by assault and you by battery." Mr. Critchett was the last president of the Ophthalmology Society of the United Kingdom, and has quite recently been appointed Surgeon-oculist to His Majesty, King Edward VII. He is best known in America for his operation for cataract extraction without a speculum, and his very ingenious treatment of conical cornea by cauterization.—*American Medicine*.

The Intraocular Complications of Beri-Beri.—There appears to be considerable room for investigation concerning the microscopical changes that occur in the visual apparatus in beri-beri, and notwithstanding that the disease is indigenous to the East, a study of these changes may be of value in as far as it may assist in clearing up some of the problematical factors occurring in allied polyneuritic affections. At a recent meeting of the Belgium Ophthalmological Society, Coppez reported a case of beri-beri, in which the visual acuity had been reduced to 1-16, with central scotomata for red and green as well as partially for yellow and blue. Holmgren's test showed normal color perception. The peripheral fields of vision were normal. Ophthalmoscopic examination showed hyperemia of the papillæ, full and distended retinal veins, the condition as a whole being a partial retrobulbar neuritis with participation of the macula. Diaphoresis, potassium iodide, strychnine hypodermically, and abstinence from tobacco, resulted in gradual improvement, with restoration of visual acuity to 1-6. It has been observed in Brazil that the oculomotor palsies, nystagmus, amblyopia, and blindness which result from beri-beri, may be cured by change of climate and the disappearance of the beri-beri. This in itself should be an incentive to neuropathologists to investigate the structural changes occurring in the optic nerve in beri-beri, and, if possible, determine whether and to what extent the papillo-macular bundles are involved.—*Philadelphia Medical Journal*.

Discovery of the Bacillus of Syphilis.—A communication of the greatest importance was read by Drs. Justin de Lisle and Louis Julien before the French Academy of Medicine recently, giving the result of their researches bearing on the specific bacillus of syphilis. This they claim to have discovered. The observations were made on the blood. They chose for their investigations cases of recently acquired syphilis in which no specific treatment had been resorted to. They found within the blood a rounded, granular, highly refractile body, capable of traversing a Chamberland filter, possessed of marked mobility, of a kind already noticed by other observers. These bodies never gave any results either in cultivations or by inoculation; this they say is not surprising in view of the fact that coagulated blood of syphilitics is incapable of conveying infection. In order to obviate the production of this substance they made use of blood plasma for their investigations, as well as of blister exudation. In the plasma they found on several occasions a form of bacillus presenting the following characteristics: It is polymorphous, varying in shape from a short bacillus measuring from 5 to 8 mm. length, and from $\frac{15}{100}$ to $\frac{3}{100}$ of mm. in width, to that of a long thread with somewhat rounded ends. This organism is very mobile and moves freely in the field of the microscope. It takes all the usual stains, but it must not be dried in the flame or at a temperature above 60°C. The best stains are alcohol-ether, a solution of osmic acid, or a saturated aqueous solution of corrosive sublimate, acidulated by the addition of acetic acid. It does not take the Gram stain. Bouillon inoculated herewith becomes turbid in 24 hours, and in the course of 4 or 5 days a slight cloud forms which does not spread or become thicker. Gelatin is slowly liquefied. Most cultures have a disagreeable, but not fetid odor. Guinea pigs into whose peritoneal cavity these cultures were injected died in from 10 to 14 days with paralysis, emaciation and abortion. Young animals succumbed in 12 hours. Injected beneath the skin it determines the characteristic symptoms, viz., loss of hair and the formation of an indurated, ulcerated plaque, with enlargement of the neighboring lymphatic glands. A 3 days old culture of this organism placed in contact with the serum of a syphilitic subject with secondary symptoms, determined marked agglutination, a phenomenon which is not produced with the serum of a healthy subject.—American Medicine.

Program of the Thirty-seventh Meeting of the American Ophthalmological Society.—Held on Wednesday and Thursday, the 17th and 18th of July, at the Pequot House, New London, Conn.:

1. Report of Committee on Supplementary Reports of Cases which have been previously reported to the Society. Drs. Jackson, De Schweinitz and Williams.

2. A Modification of Tscherning's Ophthalmophakometer. Dr. Howe.

3. An improved Lantern for Detecting Color-Blindness, to Supplement the Deficiencies of the Wool Tests. Dr. Wm. Thompson.

4. Report of Committee on Standards and Methods for Examina-

tion for Acuteness of Vision, Color-Sense and Hearing. Drs. Williams, Wm. Thompson and Dennett.

5. Contribution to the Pathology of Vascular Growths into the Vitreous, with Demonstration of a Specimen. Dr. Marple.

6. Cyst of the Vitreous Body at the Head of the Optic Nerve. Dr. Koller.

7. On Adenoma of the Meibomian Glands, with Colored Illustrations of the Clinical Picture and Microscopic Demonstrations of the Original Tumor and its Development Into Adeno-Sarcoma and Adeno-Carcinoma. Dr. H. Knapp.

8. Adenoma of the Lacrimal-Caruncle, with the Report of an Additional Case. Dr. Veasey.

9. A Case of Melanotic Giant-Cell Sarcoma of the Limbus Associated with an Implanted Secondary Growth in the Lower Lid. Drs. O. F. Wadsworth and Verhoeff.

10. Double Panophthalmitis of Septic Origin. Dr. Jackson.

11. A Study of Six Cases of Metastatic Choroiditis Occurring in the Course of Pneumonia Due to "Grippe." Dr. Bull.

12. A Case of Primary Tuberculosis of the Iris (with Microscopic Specimen). Dr. Hepburn.

13. Histological Description of an Eyeball with Unusual if not Unique Lesions in the Inner Nuclear Layer of the Retina which Clinically Simulated Glaucoma. Dr. DeSchweinitz, with collaboration of Dr. E. Shumway.

14. The Post-Operative History of Fifty Cases of Simple Chronic Glaucoma. Dr. Bull.

15. Concerning the Treatment of the Apparently Unaffected Eye in Monocular Glaucoma. Dr. DeSchweinitz.

16. Extraction of a Large Foreign Body from the Anterior Chamber with Complete Preservation of Vision. Photograph of the Foreign Body in Situ. Dr. St. John.

16½. Case of Foreign Body in the Eye Eighteen Years. Three Attacks of Uveal Inflammation Without Loss of Vision. Dr. A. A. Hubbell.

17. Results of X-ray Diagnosis and of Operation in Injuries from Foreign Bodies. Dr. Sweet.

18. A Case of Cystic Growth (not Traumatic) in the Orbit, Complicated With Exostosis of the Frontal Sinus. Dr. Andrews.

19. Trombosis of the Cavernous Sinus. Dr. Jackson.

20. Report of a Case of Injury of the Orbit, with Paralysis of the Oblique Muscles; Complete Restoration of Function of the Muscles Following Operation on the Orbit. Dr. Andrews.

21. A New Instrument for Determining the Position of the Axes of the Eyes. Dr. Williams.

22. Dislocation of the Lacrimal Gland. Dr. Mittendorf.

23. Report of Two Cases of Removal of Lens in Excessive Myopia. Dr. Minor.

24. Rapid Changes in Refraction Occurring in the Eyes of Diabetic Patients (with Case). Dr. Carpenter.

25. A Case of Hunterian Chancre of the Caruncle Followed by Secondary Symptoms. Dr. Hepburn.

26. An Unusual Case of Chronic Inflammatory Hypertrophy of the Lid Margin. Dr. Cheney.

27. Anophthalmos Congenitus (Two Cases). Dr. Claiborne.

28. A Note Concerning the Ocular Conditions in Anchylostomiasis Duodenalis. Dr. Hansell.

29. Corneal Loupe With Oblique Illumination. Dr. Koller.

30. The Electric Light. A Study of the Best Means for Softening the Light with a Minimum Loss of Illumination. Dr. Andrews.

31. A New Incandescent Electric Lamp of Ophthalmoscopic Examinations, and for Use in the Lantern for Testing Color-Sense. Dr. Williams.

32. On the Frequency of Asthenopia, Especially in America. Dr. Howe.

33. Two New Instruments. Dr. Theobald.









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